

THE
VETERINARY BULLETIN

Vol. 28]

January, 1958

[No. 1

DISEASES CAUSED BY BACTERIA AND FUNGI

MIHAJLOVIĆ, B. (1956). [**Mastitis in sheep.**]—*Acta vet., Belgrade* 6, No. 1. pp. 75-83. [In Serbian. English summary.] 1

Staph. aureus accounted for 81% of cases. M. described the preparation of a toxoid from this organism.—R.M.

STERN, H. & ELEK, S. D. (1957). **Antigenic structure of *Staphylococcus pyogenes*.**—*J. Path. Bact.* 73, 473-483. [Authors' summary copied verbatim.] 2

The antigenic properties of Cowan's serological types I, II and III of *Staph. pyogenes* were investigated by the use of whole cells, separated cell-walls and the internal or endoplasmic contents. The cell-walls offer no advantage over heat-killed whole cells serologically. Acid extracts of whole cells and cell-walls are group-specific and comparison with animal-pathogenic staphylococci shows the absence of a grouping system similar to the Lancefield system which relates the streptococcal group with the source of the streptococcus. The endoplasm contains multiple antigenic components. It does not contain α -toxin but is rich in coagulase.

Antigenic patterns of the surface antigens of the three Cowan types were constructed. The organisms possess complexes of shared major antigens, type-specific minor antigens and shared minor antigens. Penicillin- and streptomycin-resistant variants show no changes in antigenic structure.

LINSSEN, H. (1957). Beitrag zur Mastitis-therapie beim Rind — Behandlung mit verdünnter Terramycin-Suspension. [**Treatment of mastitis in cattle with diluted terramycin suspension.**]—*Prakt. Tierarzt* No. 7. pp. 187-190. 3

Eighty cows were treated for mastitis. The percentage of cures was greater, the period of treatment reduced and subsequent milk yield

higher when the dose of 15 ml. of oxytetracycline was diluted in 100-200 ml. of water before instillation into the udder.—M.G.G.

OLIVER, J., DODD, F. H. & NEAVE, F. K. (1956). **The importance of the dry period in the control of mastitis.**—*Proc. Brit. Soc. Anim. Prod.*, 1956. pp. 33-41. 4

A review of recent work done at the National Institute of Research in Dairying. [See also *V.B.* 26, 3342-45.]—R.M.

PICHUGIN, L. M. (1956). [**Pathological anatomy and histology of experimental and natural streptococcal sepsis in horses.**]—*Trud. mosk. vet. Akad.* 10, pp. 189-217. [In Russian.] 5

P. studied 16 cases of spontaneous streptococcal septicaemia and 11 cases of experimental septicaemia caused by intra-articular inoculation of haemolytic streptococci. In all cases pathological changes comprised subcuticular oedema, haemorrhagic diathesis, and degeneration and necrosis in organs and tissues. No pyaemic foci were found, except at the site of inoculation in artificially infected horses. The author claimed that the general picture was specific and could be distinguished from other forms of septicaemia and from equine infectious anaemia.

—S. TERLECKI.

LARSEN, A. B., BAISDEN, L. A., MERKAL, R. S. & MORRIS, M. J. (1957). **Methods of injecting tuberculin in cattle.**—*Amer. J. vet. Res.* 18, 546-549. [Authors' summary modified.] 6

The effect of 3 methods—superficial intradermal, deep intradermal, and thrust—of injecting tuberculin was studied in the caudal folds and neck regions of 11 cattle. Six had been sensitized with heat-killed *Mycobacterium tuberculosis* var. *bovis* and 5 with heat-killed *M. johnei*. On the caudal folds, no significant differences were observed. On the neck, how-

ever, the 2 intradermal methods gave larger reactions than the thrust, the deep intradermal giving the largest. In the neck region, the lower front sites gave the largest reactions.

ANDERSON, W. A., SHALKOP, W. T. & LARSEN, A. B. (1957). **Pathologic studies on tuberculin reactors with no visible lesions.**—*Proc. 60th Ann. Meet. U.S. live Stk sanit. Ass., Chicago*, 1956 pp. 170-176. [Authors' summary modified.] 7

A report of the pathological findings in the intestine and mesenteric lymph nodes of 51 cattle which had reacted to the tuberculin test but which had no visceral or glandular lesions of TB. Evidence of Johne's disease was found in 4. Acid-fast bacilli were demonstrated in the mesenteric lymph nodes of 5 more, in 3 of which they were associated with caseocalcareous foci the size of a pin's head and in one with an occult lesion. In the fifth, there was no associated cellular reaction.

BLACKLOCK, J. W. S. & WILLIAMS, J. R. B. (1957). **The localisation of tuberculous infection at the site of injury.**—*J. Path. Bact.* 74, 119-131. [Authors' summary slightly modified.] 8

A tuberculous bacillaemia was produced in rabbits and in g. pigs by inoculation of human tubercle bacilli into the left ventricle. Tubercle bacilli were found in the urine within 2 hours of infection. The infection was found to localize frequently at the site of injections of penicillin or peptone into muscles or joints, and around ligatures, but very rarely at the site of saline injections.

Primary lung foci were produced in rabbits and in g. pigs by direct inoculation of tubercle bacilli into the lung, and by suitable timing of injections of penicillin into muscles the infection could be localized at the injection site in a small proportion of cases. Large doses of penicillin administered i/v to tuberculous rabbits did not aggravate the infection. Injections of peptone or of preparations of penicillin into the muscles or into the peritoneum of normal animals caused a slight local mononuclear leucocyte reaction.

When g. pigs were inoculated into the left ventricle with human tubercle bacilli, the subsequent i/p injection of penicillin or of peptone caused mononuclear leucocytes which had phagocytosed tubercle bacilli to appear in the peritoneal fluid within 24 hours. This mechanism is the likely explanation of the localization of the infection where there is damaged tissue or at the site of injection of foreign substances such as penicillin or peptone.

HINGLAIS, H., HINGLAIS, M. & L'ANGLADE, M. (1956). Etude du mécanisme de l'action empêchante du sang de rat sur la prolifération des *Mycobacterium tuberculosis* humain et bovin. [**Inhibitory action of rat blood on the growth of *Mycobacterium tuberculosis*.**]—*C.R. Soc. Biol., Paris* 150, 1744-1747. 9

Neither human nor bovine tubercle bacilli grew on plain gelatin-glycerol medium. Both grew when either human or rabbit blood was added to the medium. Rat blood inhibited the human and retarded growth of the bovine types in this medium. It did not inhibit or retard growth of either type in Youmans' or Dubos' liquid medium. No adverse effect on growth, morphology, vitality or pathogenicity for g. pigs was observed after prolonged contact of the human type bacilli with rat blood. It is concluded that failure of the organism to grow in the presence of rat blood is not due to a specific inhibitory action but to the absence, in rat blood, of an element or group of elements indispensable to its growth. Another hypothesis put forward is that the organism lacks some factor (probably an enzyme) regulating the metabolism of some substance which is present in all types of blood but is not directly available in rat blood.

—T.E.G.R.

ROBSON, J. M. & SULLIVAN, F. M. (1957). **Quantitative studies on the multiplication of tubercle bacilli in vivo.**—*Amer. Rev. Tuberc.* 75, 756-767. [French and Spanish summaries. Authors' summary modified.] 10

A simple technique is described for staining tubercle bacilli in the corneas of mice infected by the intracorneal route. It was demonstrated by means of this technique that the rate of multiplication is independent of the size of inoculum. The generation time was calculated by two methods, and values of 20.4 hours and 21.9 hours were obtained. The possible existence of a lag phase was discussed, and the growth rates of different subcultures of the same bovine strain were studied. The fate of bacilli for 9 months after injection was investigated. A maximal concentration of bacilli was reached soon after the appearance of a macroscopic lesion and thereafter the number appeared to remain constant.

FUST, B. & GAY, M. (1957). Über Methoden zum Nachweis geringer Mengen von Tuberkelbazillen in Körperflüssigkeiten. [**Demonstration of small numbers of tubercle bacilli in body fluids.**]—*Schweiz. Z. allg. Path.* 20, 433-444. [English and French summaries.] 11

For microscopical demonstration, centrifuga-

tion of a sample on to a cover glass was better than concentration through a membrane filter; the membrane filter method was best for cultural demonstration.—R.M.

DURANTI, G. (1957). Vaccinazione con BCG normale e BCG isoniazido-resistente in presenza ed in assenza di un trattamento con isoniazide. [Effect of isoniazid treatment on vaccination with normal and with isoniazid-resistant B.C.G.]—*Vet. ital.* **8**, 716-718. 12

Groups of g. pigs were inoculated i/m with isoniazid-resistant B.C.G., standard B.C.G. and heat-killed B.C.G. Half of the animals in each of the first 2 groups were then given daily doses of 5 mg. isoniazid s/c for 81 days. At the end of this treatment all the g. pigs were tuberculin tested and 3 days later survivors were challenged with H37Rv. Surviving vaccinated g. pigs were killed 99-112 days after challenge and examined P.M. In the group vaccinated with killed B.C.G. there was no evidence of immunity; in those vaccinated with isoniazid-resistant B.C.G. there was evidence of immunity unaffected by treatment with isoniazid; in those vaccinated with standard B.C.G. immunity was intermediate and was not significantly affected by isoniazid. These findings are discussed and it is considered that inhibition of immunity is slight if a large dose of B.C.G. is used.

—T.E.G.R.

McMILLEN, S. & KUSHNER, D. S. (1957). Atypical acid-fast bacilli. I. A cultural scheme for rapid identification.—*Amer. Rev. Tuberc.* **76**, 103-107. [French and Spanish summaries. Authors' summary modified.] 13

A cultural scheme applicable for routine use is presented for identification of atypical acid-fast bacilli. The "atypical" strains were separated from *Mycobacterium tuberculosis* var. *hominis* by their ability to grow in dehydrated beef and yeast extract broth at 37°C. and subsequently on glycerol agar in less than 10 days.

The genus *Nocardia* was identified by its failure to grow on Littman's agar and by its colony characteristics on other media. *N. maduræ* failed to grow at 37°C.; the other three species were differentiated from each other on blood media.

Mycobact. fortuitum was recognized by its distinctive moist and rapid growth on all media. The other six organisms fell into pairs: avian type tubercle bacilli and *Mycobacterium* sp. were separable by use of Littman's medium; *M. smegmatis* and *M. phlei* were separable by colour; and bovine type tubercle bacilli and *M.*

lacticola were distinguished by bacterial-like growth in broth and were distinguishable from each other by colour.

KUSHNER, D. S., McMILLEN, S. & SENDERI, M. (1957). Atypical acid-fast bacilli. II. *Mycobacterium fortuitum*: Bacteriologic characteristics and pathogenicity for laboratory animals.—*Amer. Rev. Tuberc.* **76**, 108-122. [French and Spanish summaries. Authors' summary modified.] 14

Comparison of 17 newly isolated strains of *Mycobact. fortuitum* and 10 previously identified strains showed complete uniformity. The species was further characterized by *in vitro* resistance to streptomycin and *p*-aminosalicylic acid, and susceptibility to isoniazid and tetracycline. *M. fortuitum* cross-reacted with avian and bovine but not with human tuberculin. All strains were pathogenic for mice, causing a disseminated infection associated with lesions intermediate between bacterial abscesses and granulomas. Rabbits and g. pigs could not be infected.

DOST, F. H., DAMEROW, R. & STOLZE, F. (1956). *Corynebacterium diphtheriae* im Rachenabstrich von Hunden. [*Corynebacterium diphtheriae* in throat swabs from dogs.]—*Münch. med. Wschr.* **98**, 708-710. 15

A dog was the probable source of recurrent pharyngeal *C. diphtheriae* infection in a child. Throat swabs were taken from 100 dogs at the Berlin University small-animal clinic and *C. diphtheriae* was isolated 14 times.—R.M.

ZELENKA, P. (1957). Prikaz raširenosti maleusa u bivšoj savskoj banovini (1931-1940) i u narodnoj Republici Hrvatskoj (1946-1955). [Incidence of glanders in Croatia during 1931-1955.]—*Vet. Arhiv* **27**, 17-24. [In Croat, English and German summaries.] 16

During 1931-40 there were 162 cases of glanders in horses in the Save-Banat territory. In post-war Croatia, of which the former Save-Banat forms a large part, the disease was reported up to 1955 from 225 farms in 43 districts. The number of affected horses is not given.—E.G.

WELLMANN, G. & HEUNER, F. (1957). Über die passiv durch die Kolostralmilch erworbene Rotlaufimmunität der Ferkel. [Transfer to piglets through colostrum of passive immunity to swine erysipelas.]—*Zbl. VetMed.* **4**, 557-572. [English, French and Spanish summaries. English summary slightly modified.] 17

Piglets of all ages, so long as they are not

from immune sows and have not acquired an active immunity to swine erysipelas, are fully susceptible. Immune sows show a much higher titre of antibodies in the colostrum than in the blood, and these antibodies are transferred to the piglet through the milk, and can be demonstrated serologically in the blood of the piglet. The duration of the passive immunity acquired from colostrum depends on the level of immunity in the sow, derived from infection or inoculation. It may last only a few weeks in litters from highly immune sows. The transfer of immunity by colostrum and its presence in the piglet can be demonstrated by serological tests.

MÖHLMANN, H., HARM, M. & STÖHR, P. (1956). Hyaluronidase in der Rotlautherapie. [Hyaluronidase in the treatment of erysipelas.]—*Arch. exp. VetMed.* **10**, 688-698. **18**

Combined s/c injection of immune serum, penicillin and hyaluronidase was as effective as administration of serum i/v and penicillin s/c in reducing mortality in mice infected with *E. rhusiopathiae* 12 hours previously, and was the more effective treatment 24 hours after infection. Similar results were obtained in an identical experiment, but without the use of penicillin. In 176 experimentally infected pigs the difference in treatment, as measured by fluctuations in temp., was not so pronounced. The best results were from the administration of serum i/v and penicillin s/c, but s/c administration of serum, penicillin and hyaluronidase was almost as good.—M.G.G.

VALENTIN, F., RENAULT, L. & JOUBERT, L. (1956-1957). Contribution à l'étude du rouget aviaire. Rouget enzootique chez le canard et le faisan. [*Erysipelothrix rhusiopathiae* infection in ducks and pheasants.]—*Bull. Soc. Sci. vét. Lyon* **58** & **59**, 325-331. [Discussion: p. 332. **19**

Two outbreaks, characterized by acute septicaemia, are described, causing the deaths of 4 in a small flock of pheasants and all of a flock of 120 ducklings. One of the pheasants had previously been kept on a pig farm. The 2 strains of the organism isolated from the spleen and kidneys were identical with standard strains of porcine origin.—M.G.G.

STEFFEN, J. (1957). Przypadek pososznicy krwotocznej w fermie norek. [Pasteurellosis in mink.]—*Méd. vét. Varsovie* **13**, 334-335. [In Polish.] **20**

Within 4-5 days after arrival on a farm 4 of 70 mink imported from Finland died. P.M. examination revealed lesions of septicaemia and

Past. septica was isolated in culture and by animal inoculation. At the same time fowl cholera killed a great number of poultry on the same and a neighbouring farm where there were no imported mink and where the mink remained healthy. The outbreak among mink was checked by s/c administration of pasteurized serum in doses of 1-2 ml. S. considered that transport fatigue made the mink more susceptible to the disease. He recommends that mink should not be kept in the neighbourhood of poultry.—M. GITTER.

YAW, K. E. & KAKAVAS, J. C. (1957). A comparison of the protection-inducing factors in chickens and mice of a type 1 strain of *Pasteurella multocida*.—*Amer. J. vet. Res.* **18**, 661-664. [Authors' summary modified.] **21**

Crude preparations of capsular polysaccharide from a Type 1 strain of *Past. septica* protected chickens and mice against challenge with virulent bacteria of this strain. Somatic or intracellular antigens of the unencapsulated variant, or both, protected chickens but not mice. Possible explanations of these phenomena are discussed. It is suggested that the protective somatic antigen(s) of the various serological types may differ.

ROBINSON, G. L. (1957). *Pseudomonas pyocyanea* in cetrimide.—*Brit. med. J.* May 25th, p. 1242. **22**

In a hospital where beds were shared by two surgeons, one using flavine for skin preparation, the other using cetrimide ("Cetavlon"), mild wound infection occurred in the wounds of the patients given the latter preparation. A sample of Cetavlon sown into culture medium yielded growth of *Ps. pyocyanea*. R. reported this experience because he understood that clinicians are not aware of the danger of using this product and that some bacteriologists actually use cetrimide for the differential culture of this organism. As cetrimide is popular because of its soapiness, he suggested that soap and water should be used for skin preparation, followed by a good antiseptic, e.g. flavine. He stated that the makers recommend that chlorhexidine ["Hibitane"] should be added to Cetavlon.

—W.A.P.

SANFORD, J. P. & NOYES, H. E. (1957). Effect of total-body X-irradiation on the susceptibility of mice to *Escherichia coli* endotoxin.—*Radiation Res.* **7**, 58-64. [Authors' summary modified.] **23**

The exposure of mice to 400 r total-body

X-irradiation uniformly resulted in leucopenia and loss of weight. No increase in the susceptibility of X-irradiated mice to an endotoxin prepared from a strain of *E. coli* could be demonstrated, when compared to that of control mice, at intervals over a 21-day period of study.

PEREK, M. (1957). Isolation of a paracolobactrum organism pathogenic to chicks. — *J. infect. Dis.* **101**, 8-10. [Author's summary modified.] **24**

Paracolobactrum aerogenoides was isolated from diseased chicks. The organism was the cause of an epidemic in a batch of chicks. Cultural characteristics and transmission are described.

ANON. (1956). The nomenclature of coli-aerogenes bacteria. Report of the coli-aerogenes (1956) sub-committee of the Society for Applied Bacteriology.—*J. appl. Bact.* **19**, 108-111. **25**

In 1949 the Coliform Subcommittee of the Society of Applied Bacteriology proposed a classification for lactose-fermenting coli-aerogenes bacteria. In 1949 the lactose-fermenting and some non-lactose-fermenting strains were regarded as members of a large genus, *Bacterium*. Since then, there has been an increasing tendency to place *Bacterium coli commune* in a different genus from *Bacterium lactis aerogenes* and to consider that the so-called Intermediate group, *Escherichia freundii* (Braak) Yale, should form another group or genus.

The generic name *Bacterium*, although conserved by the Judicial Commission (1951), was later rejected by the International Committee on Bacterial Nomenclature (1953). It is not the duty of the International Committee on Bacteriological Nomenclature to state what names should be used in place of *Bacterium*.

The above coli-aerogenes subcommittee now proposes nomenclature as in the table below and the Editors of the *Journal of Applied Bacteriology* agree with it.

THE RELATIONSHIP OF DIFFERENT CLASSIFICATIONS OF THE COLI-AEROGENES GROUP

Coliform Sub-Committee (1949)		Reactions					Wilson et al (1955)	Coli-aerogenes (1956) Sub-committee		
Name	Group	Indole	M.R.	V-P	citrate	44°	gelatine	Scientific name	Descriptive name	Abbreviation
<i>Bacterium coli</i> type I	Ia	+	+	-	-	+	-	<i>Bact coli</i> type I	<i>Escherichia coli</i>	Esch. coli (indole + 44° +) <i>E. coli</i> I
<i>Bacterium coli</i> type I, 44° -	Ib	+	+	-	-	-	-	Irregular coli-like I	<i>Escherichia coli</i>	Esch. coli (indole + 44° neg.) <i>E. coli</i> III
<i>Bacterium coli</i> type II	IIa	-	+	-	-	-	-	<i>Bact. coli</i> type II	<i>Escherichia coli</i>	Esch. coli. (indole -) <i>E. coli</i> II
Intermediate type I	IIIa	-	+	-	+	-	-	Intermediate type I	<i>Citrobacter freundii</i>	<i>Citrobacter freundii</i> <i>Cit. freundii</i> I
Intermediate type II	IVa	+	+	-	+	-	-	Intermediate type II	<i>Citrobacter freundii</i>	<i>Citrobacter freundii</i> (indole +) <i>Cit. freundii</i> II (indole +)
<i>Bacterium aerogenes</i> type I	Va	-	-	+	+	-	-	<i>Bact. aerogenes</i> type I	<i>Klebsiella aerogenes</i>	<i>Klebsiella aerogenes</i> <i>K. aerogenes</i> I
<i>Bacterium carotovorum</i>	Vc	-	-	+	+	-	+		<i>Erwinia carotovora</i>	<i>Erw. carotovora</i>
<i>Bacterium cloacae</i>	Vb	-	-	+	+	-	+	<i>Bact. cloacae</i>	<i>Klebsiella cloacae</i>	<i>Klebsiella cloacae</i> <i>K. cloacae</i>
<i>Bacterium aerogenes</i> type II	VIa	+	-	+	+	-	-	<i>Bact. aerogenes</i> type II	<i>Klebsiella aerogenes</i>	<i>Klebsiella aerogenes</i> (indole +) <i>K. aerogenes</i> II
								Irregular types V-VIII	[Cannot be named without further investigation: at present should be described by the use of suffixes.]	

Serological typing of coli-aerogenes bacteria is becoming increasingly important and they are distinguished by arabic numerals, without the word "serotype". The fermentation of lactose at 37°C. is retained as the essential attribute for the identification of coli-aerogenes bacteria in the assessment of the sanitary quality of water, but it is recommended that incubation at 30°C. be used for the examination of milk and milk products. Taxonomists and other workers dealing with the serological typing of pathogenic or other varieties of coli-aerogenes organisms should, however, bear in mind that lactose fermentation is not essential for the inclusion of strains in the above classification.—W.A.P.

MONTEVERDE, J. J. & GARBERS, G. V. (1956).

Salmonellosis de los equinos. Infección debida a *Salmonella bovis-morbificans*. [*Salmonella bovis-morbificans* infection in a foal.]—*Rev. Med. vet., B. Aires* **38**, 1-6. [English summary.] **26**

Chronic disease in a foal aged 20 days was characterized by weakness, inappetence, diarrhoea followed by constipation, loss of condition, staggering gait, stiffness of the joints and widespread abscesses containing thick yellow pus. Progress was slow and the animal completely recovered after 90 days. *S. bovis-morbificans* was abundant in the pus and was virulent for lab. animals. The agglutinating titre of the patient's serum was below 1:20 ("O" and "H" antigens). No pathogenic organisms were demonstrable in the blood or faeces. Diarrhoea, lasting a few days, was observed in other young foals, but was not accompanied by other symptoms. From a review of the literature it is concluded that this is the first occurrence in Argentina.—T.E.G.R.

MOORE, B. (1957). Observations pointing to the conjunctiva as the portal of entry in salmonella infection of guinea-pigs.—*J. Hyg., Camb.* **55**, 414-433. [Abst. from author's summary.] **27**

In the course of salmonella epidemics in g. pigs due to *S. enteritidis* or *S. typhi-murium* conjunctivitis was widespread, and conjunctival swabbing was found to be a more effective procedure for detecting the spread of infection than the examination of rectal swabs. Eye-swabbing with segregation of eye-positive g. pigs and their cage-mates was apparently successful in controlling two *S. enteritidis* epidemics. Later observations showed that the conjunctival route was far more effective for producing systemic salmonella infection in g. pigs than the oral. Blood-borne invasion from the primary conjunc-

tival lesion occurred by the lymphatic route. Gut infection of g. pigs infected experimentally through the eye was secondary to spleen infection and probably occurred by excretion of salmonella through the gall-bladder. Effectively goggled g. pigs were highly resistant to infection in environments heavily contaminated with *S. enteritidis* which produced high infection rates in ungoggled control animals.

I. HOBSON, D. (1957). The behaviour of a mutant strain of *Salmonella typhimurium* in experimental mouse typhoid.—*J. Hyg., Camb.* **55**, 322-333. **28**

II. HOBSON, D. (1957). Resistance to reinfection in experimental mouse typhoid.—*Ibid.* **334-343**. [Absts. from author's summaries.] **29**

I. A streptomycin-resistant mutant of a virulent strain of *S. typhi-murium* was less virulent to mice than the parent strain. The difference in virulence was observed only when mice were infected with small numbers of organisms. Although the mutant strain caused fewer deaths than the parent strain it remained capable of establishing persistent infection in the majority of animals. The essential difference between the two strains was the speed and probability of attaining a critical final population. The mutant strain of *S. typhi-murium*, both *in vitro* and *in vivo*, had a slower growth rate than the parent strain. A possible hypothesis to explain the importance of this finding in relation to the outcome of infection was discussed.

II. Mice surviving infection with a strain of *S. typhi-murium* of reduced virulence developed a progressive resistance to re-infection with virulent strains. The degree of resistance was greater than that of vaccinated mice, although the primary infection had not caused any significant degree of natural selection or higher serum titres of O antibody.

NOVICKÝ, R. (1956). Vhodnost bakteriologického vyšetření trusu k detekci salmonellosy u drůbeže. [Examination of faeces for salmonellosis in fowls.]—*Sborn. čes. Akad. zemědělsk. Věd, Vet. Med.* **29**, 325-334. [In Czech, English, German and Russian summaries.] **30**

Clinical, serological, bacteriological and P.M. examination of organs and muscles for salmonella was negative in 22 ducks, 4 geese and 4 fowls, all of which were faecal excretors. 324 ducks, 35 turkeys and 42 fowls in whose faeces salmonella had been found were examined P.M. and bacteriologically. Salmonella was isolated from the gall-bladder of only one duck which

had also nodular liver lesions. N. concluded that bacteriological examination of faeces was an unsuitable method of diagnosis of avian salmonellosis in the field.—E.G.

BATTELLI, C. (1957). Risultati ottenuti con il nitrofurazone su polli sierologicamente positivi per pullurosi. [**Nitrofurazone in the treatment of chronic carriers of *Salmonella pullorum*.**]—*Atti Soc. ital. Sci. vet., Perugia* 1956 10, 592-595. [English and French summaries.] 31

Two groups of hens, which had been confirmed by rapid serum agglutinin tests as chronic *S. pullorum* carriers, were treated with nitrofurazone at the rate of 0.02% in the mash. Of the first group of 26 only 2 remained positive at 100 days after the beginning of two 10-day courses of treatment, given at 20 days' interval, and these, as well as a further 4 animals, were found to be positive 60 days after a third course. In the other group, 7 out of 29 hens remained positive 90 days after a single 10-day course, while 6 of these, plus 6 other hens, were positive 60 days after a second course. Confirmation of these results by more exacting serological and bacteriological tests was being sought.

—G. P. MARSHALL.

I. SMITH, H. WILLIAMS (1956). The use of live vaccines in experimental *Salmonella gallinarum* infection in chickens with observations on their interference effect.—*J. Hyg., Camb.* 54, 419-432. 32

II. SMITH, H. WILLIAMS (1956). The immunity to *Salmonella gallinarum* infection in chickens produced by live cultures of members of the *Salmonella* genus.—*Ibid.* 433-439. 33

I. Live attenuated smooth (9S) and rough (9R) vaccines were tested. Challenge was by oral administration of a smooth strain (9) of *S. gallinarum*. Immunity in birds vaccinated at 7 weeks with 9R began to decrease 12 weeks later. With 9S it was complete 4, 12 and 34 weeks later, 9R did not produce demonstrable agglutinins against smooth *S. gallinarum*; it was non-lethal to day-old chicks and did not revert to the smooth virulent types. 9S produced agglutinins; it was lethal to day-old chicks, but its virulence did not increase by passage, nor did deaths occur among 5 to 12-week-old birds or laying hens. Both vaccines produced a good immunity in laying hens but 9S caused a marked reduction in egg production, while 9R did not. Interference immunity was engendered by both vaccines and in the case of 9S it was still produced to some extent 2 days after infection.

Indian ink, injected i/v, increased the severity of infection and injection of virulent *E. coli* simultaneously with *S. gallinarum* infection mitigated the disease.

II. Complete immunity, equal to that produced by *S. gallinarum*, was obtained with *S. pullorum*. Less complete, though substantial immunity, was set up by 11 of 12 other species of Group D salmonella. No immunity was produced by 3 of 4 rough Group D strains or by an avirulent strain of *E. coli*; the 4th rough strain produced considerable immunity though not to the same extent as rough strains of *S. gallinarum*. A definite assay of the immunity produced by Group B strains of *S. typhi-murium* and *S. chester* was not possible owing to the lethal nature of the organisms. A slight degree of immunity, considered to be non-specific, was produced by 2 strains each of Group C and Group E salmonella.—T.E.G.R.

GEURDEN, L. M. G., DEVOS, A. & VAN DEN WYNGAERT, M. (1957). Overzichtelijke studie van de *Salmonella*-types geïsoleerd en geïdentificeerd in het laboratorium. [**Survey of salmonella types isolated and identified at the Laboratory for Bacteriology and Hygiene of Domestic Animals, Ghent.**]—*Vlaams. diergeneesk. Tijdschr.* 26, 177-184. [In Flemish. English, French and German summaries. English summary modified.] 34

Salmonella strains isolated in the period 1941-57 were: *S. abortus-equi*, *stanley*, *typhi-murium*, *bredeney*, *stanleyville*, *thompson*, *manhattan*, *bareilly*, *newport*, *sendai*, *dublin*, *enteritidis*, *pullorum*, *gallinarum*, *anatum*, *newington*, and *new brunswick*. The frequency and the origin of the different types were discussed. The following studies were made: mechanism of food poisoning caused by *S. abortus-equi*, *thompson*, *newport*, and *dublin*; infections in poultry with atypical strains of *S. pullorum* and with *S. new brunswick*; polyarthritis in a foal with *S. newington*. The importance of birds and reptiles as sources of salmonella was emphasized.

CURY, R. & TROISE, C. (1956). Técnica de borbujamento no preparo de vacinas. [**Aeration technique in the preparation of vaccines.**]—*Bol. Soc. paul. Med. vet.* 9, 215-225. 35

Vaccines prepared from aerated cultures of *Salmonella dublin*, *S. abortus-equi*, *S. gallinarum* or *S. cholerae-suis* were of higher potency than those prepared from non-aerated cultures. Addition of aqueous soln. of chlorophyll just

before the addition of formaldehyde, was said to neutralize the toxic effect occasionally caused by large doses of vaccine.—R.M.

MILUNOVIĆ, M. (1957). Primjena brze aglutinacije mlijeka (BAM) u otkrivanju govede bruceloze u mliječnim uzgojima. [**Rapid milk plate-test for diagnosis of brucellosis in cattle.**]—*Vet. Arhiv*, **27**, 162-169. [In Croat. English and German summaries]. 36

A comparison was made between the results obtained by the milk plate test and the serum agglutination test with samples from 186 cows from three healthy herds and 270 cows from three herds with chronic brucellosis. All samples from non-infected herds yielded negative serum agglutination reactions but five yielded positive milk plate tests. Both tests agreed in 200 samples from the infected herds. Of 98 positive serum agglutination reactions 56 were confirmed by the milk plate test. Of 31 doubtful agglutination results, six were doubtful, 20 negative and 5 positive to the milk plate test. Three samples yielded positive milk tests but negative serum tests. It was concluded that the milk plate test was a convenient and reliable method to be used in routine screening of herds.—E.G.

ČERNÝ, L. & MENŠÍK, J. (1956). Příspěvek k průkazu inkompletních protilátek u kolostrální imunity skotu v průběhu brucelózní infekce. [**Demonstration of incomplete brucella antibodies in immunity produced by colostrum.**]—*Sborn. čes. Akad. zemědělsk. Věd, vet. Med.* **29**, 81-98. [In Czech, German and Russian summaries]. 37

Incomplete brucella antibodies were not demonstrable by the Coombs test in serum from calves of infected cows, taken before ingestion of colostrum, but were present in samples taken after ingestion of colostrum. Significant titres persisted for 2-5 months after birth.—E.G.

SCHINDLER, R. & REUSSE, U. (1957). Untersuchungen über die Brauchbarkeit von embryonierten Hühnereiern für die Brucelloseforschung. [**Use of embryonated hens' eggs in brucellosis research.**]—*Mh. Tierheilk.* **9**, 75-78. 38

Embryonated hens' eggs were highly susceptible to infection with brucella. A single organism could initiate an infection, and differences in virulence between various strains were manifested only by slight variations in the time of death. Immune serum did not influence infection in eggs. Mice, on the other hand, were very suitable for virulence and serum protection tests.—M.G.G.

BÜRKE, F. (1957). Kutantest und Präcipitation des Blutserums mit einer nicht-agglutinogenen Fraktion aus *Brucella abortus* bei Meerschweinchen nach Infektion mit lebenden Bangbakterien. I. Infektionsmodus und Bestimmung der Allergendosis für den Kutantest. [**Skin test and precipitation of blood serum with non-agglutinogenic fraction of *Brucella abortus* in guinea pigs infected with the live organism.**]—*Zbl. VetMed.* **4**, 573-580. [English, French and Spanish summaries. English summary modified.] 39

The relationship between positive results of the skin test and of an *in vitro* precipitation in active brucellosis, previously reported in rabbits and cattle [*V.B.* **27**, 1987], was confirmed in the g. pig. Massive and in part repeated infection of g. pigs with "Strain 19" produced, as expected, no obvious ill effects, and skin and precipitation tests with the allergen were all negative, although the animals had a high serum agglutinin titre. Infection of g. pigs by a virulent strain of *Br. abortus* with localization in the spleen resulted in positive skin and precipitation tests in most animals. (If the g. pigs were first tested 4 to 6 weeks after infection, instead of earlier than this, both tests were positive in nearly all the animals.) In further studies the dose of allergen was fixed at 0.1 mg. per injection, dissolved in 0.1 ml. of normal saline, and injected intradermally. The test is best read 24 hours after injection. The interpretation of the test is discussed.

ROGALSKI, L. & SERAFIN, C. (1957). Wpływ stężenia soli kuchennej na odczyn aglutynacyjny z antygenem *Br. abortus bovis* u świń. [**Influence of saline concentration on the agglutination test in pigs, using *Br. abortus* antigen of bovine origin.**]—*Méd. vét., Varsovie* **13**, 333-334. [In Polish.] 40

Using 206 serum samples, from slaughtered pigs, in dilutions 1:25.5-1:100 and varying the concentration of salt from 0.5% to 25% the authors found that 5 and 10% concentrations gave more definite results than those obtained with physiological saline solution.—M. GITTER.

NIŽNÁNSKY, FR. & KRČMÉRY, VL. (1956). Mikrodifusionsmethode zur Bestimmung der Ureaseaktivität von Brucellastämmen. [**Micro-diffusion method for determining the urease activity of brucella strains.**]—*Arch. exp. VetMed.* **10**, 930-934. 41

The method used was based on that described by Conway (1933) for the determination

of ammonia. Urease activity was greater in *Br. suis* than in *Br. abortus*. [See also *V.B.* 27, 387.]

—R.M.

KURZEJA, K. (1957). Bruceloza wśród personelu weterynaryjnego, zootechnicznego i pracowników przemysłu mleczarskiego i mięsnego woj. rzeszowskiego. [**Brucellosis in veterinary, zootechnical, milk and meat industry personnel.**]—*Méd. vét., Varsovie* 13, 331-332. [In Polish.] 42

Agglutination and complement-fixation tests for brucellosis were carried out in one county on 1351 people of whom 75 (5.5%) gave a positive reaction; 14 of these were clinical cases (all veterinary personnel) and one veterinarian died. The highest incidence of reactors, 31 of 199 (15.5%), was among the veterinary personnel. Among the milk and meat industry personnel the incidence of reactors was 3.9 and 3.4% respectively and in the State Farms, excluding veterinarians, 5.2%. Of 14 animal attendants examined, one gave a positive reaction.

—M. GITTER.

CYRUS, B. (1956). Pokus o užití alergických zkoušek při diagnostice leptospiros intra vitam. [**Allergic tests for the diagnosis of leptospirosis.**]—*Sborn. čes. Akad. zemědělsk. Věd, vet. Med.* 29, 133-156. [In Czech. English, German and Russian summaries.] 43

C. described the diagnostic value of phenolized *L. icterohaemorrhagiae* and *L. grippotyphosa* allergens. Application was by the i/d and s/c routes, by scarification and by inj. into the conjunctival sac, using experimentally infected animals with titres of 1:10,000—1:50,000. The i/d method was found reliable in horses, dogs and poultry. With the other methods of application reactions were not sufficiently marked to be diagnostic. In horses with mixed leptospiral infections, the allergen was prepared from the strain which yielded the highest agglutination titre. In dogs an allergen was prepared from the *L. icterohaemorrhagiae* strain used for experimental infection, but a similar somewhat weaker reaction was also obtained with *L. grippotyphosa* antigen.—E.G.

ZWIERZ, J. & ZWIERZCHOWSKI, J. (1957). Zwalczenie epizootii leptospirozy lisów niebieskich przy użyciu surowicy, szczepionki i antybiotyków. [**Control of leptospirosis in foxes with serum, vaccine and antibodies.**]—*Méd. vét., Varsovie* 13, 321-325. [In Polish. English and Russian summaries.] 44

An account of an outbreak in which 44 out of 262 adult foxes died and nearly all females

in the later stages of pregnancy aborted. The disease ran a 2-3 days course and spread rapidly. The outbreak was stopped by the administration of 15-18 ml. serum to all adult contacts and treating the sick ones with 20-25 ml. serum, 100,000 units penicillin and 30 mg. per kg. body wt. of aureomycin (*per os* 3 times daily for 4 days). A second dose of serum was given 7-10 days later and after 10-17 days all adults were vaccinated. Serological examination, 1-3½ months after the outbreak, revealed that 99 out of 233 adult foxes gave a positive reaction, mainly to *L. icterohaemorrhagiae*, and 4 out of 739 young ones, born shortly before, during or after the outbreak, gave a weak reaction, (titre 1:30); 10 months after the outbreak 2 of 265 animals gave a low titre, 1:30, to *L. sejevae* and *L. mitis*.—M. GITTER.

I. BULLEN, J. J. & SCARISBRICK, R. (1957). Enterotoxaemia of sheep: experimental reproduction of the disease.—*J. Path. Bact.* 73, 495-509. 45

II. BULLEN, J. J. & BATTY, I. (1957). Experimental enterotoxaemia of sheep: the effect on the permeability of the intestine and the stimulation of antitoxin production in immune animals. — *Ibid.* 511-518. [Authors' summaries copied *verbatim*.] 46

I. Normal sheep developed typical acute enterotoxaemia when cultures of *Cl. welchii* type D were introduced into the intestine after large feeds of wheat, oats or lucerne. Overeating was found to play an essential part in the development of the experimental disease. Introduction of the culture into the intestine without overeating appeared to be harmless. Overeating and the successful reproduction of the disease was associated with the presence in the intestine of undigested or partly digested food. In this environment *Cl. welchii* grew extremely rapidly. The growth of the organism in the absence of this undigested food was comparatively poor.

In every case of the experimental disease high concentrations of epsilon toxin were present in the intestine for several hours. Low concentrations of toxin in the intestine, even for long periods, were harmless. High concentrations of toxin were also harmless if present only for very short periods. Overeating alone frequently gave rise to ruminal acidosis which was sometimes fatal. This syndrome was distinguished from experimental enterotoxaemia. Enterotoxaemia could not be reproduced in immune animals even though the intestine was exposed to high concentrations of epsilon toxin for very long periods.

II. When concentrated diphtheria antitoxin is dripped into the duodenum of normal sheep small but constant amounts are absorbed into the blood showing that the intestine is very slightly permeable to this protein. The rate of absorption of the antitoxin is not significantly affected by the sheep overeating or by acid conditions in the rumen.

In experimental enterotoxaemia the rate of absorption of antitoxin is greater than normal, showing that the permeability of the intestine is increased. In immune sheep the absorption of epsilon toxin from the intestine may lead to a rapid increase in the amount of circulating epsilon antitoxin.

SZABÓ, I. & SZENT IVÁNYI, T. (1957). A malacok fertőző elhalásos bélgyulladás. II. A betegség előfordulása és az ellene való védekezés. [Infectious necrotic enteritis in piglets. II. Incidence and control.]—*Mag. állator. Lapja* 12, 73-76. [In Hungarian. English and Russian summaries.] 47

Necrotic enteritis resulting from *Clostridium welchii* Type C toxin caused heavy mortality in piglets in Hungary. The disease did not respond to treatment with antibiotics or other drugs. Satisfactory prophylactic measures included vaccination of sows during the second or third month of pregnancy. Litters born to vaccinated dams received *via* the colostrum sufficient antibody to immunize them for the first few weeks of life. Alternatively, piglets were injected with hyperimmune serum within 24 hours of birth. [For part I, see *V.B.* 26, 1957.]—E.G.

WILLIS, A. T. (1957). A rapid method for the purification of some clostridia from mixtures with other organisms, especially the aerobic spore-formers.—*J. Path. Bact.* 74, 113-117. [Author's summary.] 48

A method is described for the separation of clostridia from mixtures with other organisms, especially anthracoid bacilli. It consists essentially of the rapid passage of the mixed culture through a streptomycin-glucose-broth medium. The streptomycin inhibits the growth of anthracoid bacilli but does not interfere with the growth of anaerobes. Adjustment of the specific gravity of the medium ensures the development of early basal growth, thus making maximum use of the high growth rate in glucose broth of such anaerobes as *Cl. welchii*.

VON DEWITZ, J.-A. (1956). Über das Vorkommen von Tetanus-Antitoxin im Blutserum bei gesunden Rindern in verschiedenen Gegenden Niederbayerns unter Berücksichtigung der örtlichen Bodenverhältnisse. [Occur-

rence of tetanus antitoxin in the serum of healthy cattle in districts of Lower Bavaria, with reference to soil type.]—*Inaug. Diss., Munich* pp. 40. 49

The average conc. of tetanus antitoxin in the serum of apparently healthy cattle, not vaccinated against tetanus, varied from district to district, and was apparently related to soil type. Formation of antitoxin was lowest, and occurred at a later age, in districts where the calcium content of the soil was low, giving a correspondingly low pH of fodder plants.—R.M.

GÖTZ, L. (1956). Bakteriologische Untersuchungen über das Vorkommen von Vibrionen in den Geschlechtsorganen weiblicher und männlicher Rinder. [Bacteriological studies of the occurrence of vibrios in the sex organs of bulls and cows.]—*Inaug. Diss., Munich* pp. 50. 50

Vaginal mucus and preputial washings from 554 cattle were cultured on thiol medium containing 0.5% agar. Mucus samples were obtained by irrigation of the vagina with physiological saline: comparison with material obtained after slaughter revealed that this method did not detect all cows harbouring vibrios. A delay of 24 hours between collecting and culturing a sample reduced by half the chance of isolating vibrios. Nine strains of vibrio were obtained in pure culture: 7 strains (from 6 bulls and a cow) were non-pathogenic and 2 (from a cow and a bull) were *V. fetus*.—R.M.

BLOBEL, H., SIMON, J. & McNUTT, S. H. (1957). Observations on experimental bovine *Vibrio fetus* infection.—*Amer. J. vet. Res.* 18, 579-583. [Authors' summary modified.] 51

V. fetus infection was produced by the vaginal and uterine routes in 10 of 14 heifers. Oral administration to a pregnant heifer did not result in infection. Evidence of infection was based upon the "repeat-breeding syndrome," recovery of *V. fetus* from the uterine discharge, and demonstration of specific agglutinins in the cervico-vaginal secretions. There was a correlation between detectable vaginal mucus agglutinins and lowered fertility. *V. fetus* was repeatedly recovered from an animal in which vaginal mucus agglutinin titres reached 1:2,560. The vaginal mucus agglutination test was a valuable aid in diagnosis, provided that samples were not collected at or near oestrus. The interval between the appearance of detectable levels of agglutinins in the cervicovaginal secretions and exposure was 4-10 weeks. The vaginal mucus titres persisted for about 4-12 months. The practical value of the serum

agglutination test is doubtful. Agglutinins to *V. fetus* were not demonstrable in the milk of a known infected cow. Conjunctival administration and intradermal injection of homologous antigens did not elicit any conclusive reactions.

JENSEN, R., MILLER, V. A., HAMMARLUND, M. A. & GRAHAM, W. R. (1957). **Vibronic abortion in sheep. I. Transmission and immunity.**—*Amer. J. vet. Res.* **18**, 326-329. 52

Twenty-three pregnant ewes, at the beginning of the fifth month of gestation, were each given orally 40 g. of infected tissues from aborted fetuses; 17 ewes aborted. In a second, similar experiment 16 out of 21 animals aborted. The number of abortions was low, however, in groups of pregnant ewes that received *per os* infected lamb tissue filtrate, *V. fetus* culture, dung from an infected pen, or infected calf tissues. Of 88 ewes that had aborted or as yearlings had been fed infected tissue in the previous year, only 7 aborted after receiving infected tissue at the 5th month of pregnancy. None of 68 ewes aborted after being mated with rams infected with *V. fetus*.—M.G.G.

ROBERTSTAD, G. W. & MORRISON, S. M. (1957). **An improved method for the rapid cultivation of large yields of *Vibrio fetus*.**—*Amer. J. vet. Res.* **18**, 705-707. [Authors' summary modified.] 53

High yields of *V. fetus* were obtained from cultures incubated on a shaker for 24 hours.

HITZMANN, G. (1957). Die puerperale Sepsis als Ursache der Agalaktie der Sauen und ihre Behandlung mit Aureomycin. [**Puerperal sepsis as the cause of agalactia in sows; its treatment with aureomycin.**]—*Dtsch. tierärztl. Wschr.* **64**, 338-339. 54

28 sows which developed agalactia in the course of puerperal sepsis due to a variety of organisms were treated with a single intra-uterine application of 1 g. aureomycin, supplemented by injections of ergot and pituitrin. 23 animals responded to a single treatment, while 3 required further pituitrin, and in the remaining 2 relief of the agalactia could not be obtained, in spite of the uterine sepsis having been cured.

—G. P. MARSHALL.

DAVIES, M. E. (1957). **Resistance to antibiotics found in some strains of commonly occurring bacteria.**—*Brit. vet. J.* **113**, 279-284. [Authors' summary modified.] 55

In 139 healthy dogs there was only a low proportion of strains of 7 commonly occurring bacterial genera which were resistant to 5 anti-

biotics in general use. A higher proportion was found in some genera isolated from 205 clinical cases.

ŠIPKA, M. (1957). **Candida tropicalis kao uzročnik mastita kod krava. [*Candida tropicalis* as the cause of bovine mastitis.]**—*Vet. Glasn.* **11**, 747-751. [In Croat. German summary.] 56

C. tropicalis was isolated from a cow with mastitis. There was no history of treatment with antibiotics. The organism was not demonstrable microscopically in centrifuged milk sediment but was grown on agar and blood media. Edwards's medium was unsuitable. The strain was pathogenic by infusion into the teats of healthy cows. Cultures retained virulence even 2 years after isolation. Rabbits injected i/v and mice s/c with a suspension remained healthy for a period of 21 days of observation. There was no reaction at the site of injection, nor were there lesions in organs at P.M. examination.—E.G.

KAPLAN, W., GEORG, L. K., HENDRICKS, S. L. & LEEPER, R. A. (1957). **Isolation of *Microsporium distortum* from animals in the United States.**—*J. invest. Derm.* **28**, 449-453. [Authors' summary modified.] 57

The isolation of *M. distortum* from 4 pet monkeys and a dog is reported, for the first time in the U.S.A. The mycological findings, clinical appearance and significance of these cases are presented.

NEWING, C. R. (1957). **A quantitative complement fixation test for use in laboratory investigations of bovine contagious pleuropneumonia.**—*Bull. epiz. Dis. Afr.* **5**, 149-159. [In French pp. 225-236. Author's summary modified.] 58

The principles on which a constant antibody/antigen quantitative c.f. test for use in lab. investigations of bovine contagious pleuropneumonia is based are stated, together with the objections to the use of a qualitative test. The reasons are given for the adoption of a method of antigen titration based on linearity of response. The results of a qualitative test and the quantitative test on 12 sera are compared. The mean anticomplementary activity of 100 bovine sera was 0.2046 Complement Units. The occurrence of low grade reactions to this test in normal cattle is discussed. The incomplete correlation between this test and the slide agglutination test may be due to a multiplicity of antibodies.

PIERCY, S. E. & KNIGHT, G. J. (1957). **Studies with avianised strains of the organism of contagious bovine pleuropneumonia. IV. The pre-**

paration, titration and challenge of avianised bovine pleuropneumonia vaccines.—*Bull. epiz. Dis. Afr.* 5, 161-173. [In French pp. 237-251. Authors' summary modified.] 59

The techniques used in the preparation, titration and challenge of dried avianized pleuropneumonia vaccines are described in detail, including a technique ensuring that challenge cultures are adequately virulent. A dose of 0.001 g. of dried avianized vaccine prepared from Strain T₃ at the 11th egg passage, when inoculated into the tips of the tails of 10 cattle, caused no local reactions and conferred a solid immunity against a challenge that caused severe reactions, with 6 deaths, in all of 10 control animals. One batch of 100 eggs provides about 800,000 doses. The possibility and the difficulties of using an avianized vaccine more virulent than the present Strain T₁ vaccines under East African conditions are discussed.

PRIESTLEY, F. W. & DAFALLA, E. N. (1957). Immunisation against contagious bovine pleuropneumonia using dried organisms and adjuvant.—*Bull. epiz. Dis. Afr.* 5, 177-186. [In French pp. 253-263. Authors' summary modified.] 60

Inoculation of cattle with dried organisms of bovine contagious pleuropneumonia reconstituted in 0.5% agar induced immunity to challenge within 3 weeks and an appreciable degree of immunity still existed over 12 months later. Dried vaccine of this nature can be stored without appreciable loss of potency for at least 14 months at 37°C., and probably for much longer at ice-chest temp. With an adjuvant, the number of organisms required to produce immunity was very small; 700 doses could be produced from 1 ml. of serum broth culture. There is some (inconclusive) evidence to suggest that severe reactions only occur when the vaccine is inoculated s/c into the tail.

DAFALLA, E. N. (1957). A study of the antigenic structure of the contagious bovine pleuropneumonia organism.—*Bull. epiz. Dis. Afr.* 5, 135-145. [In French pp. 211-221. Author's summary slightly modified.] 61

Two substances, designated fractions A and B, were isolated from this organism. Fraction A occurs in the free state in large amounts in pleural exudate and "lymph" and sometimes in the blood stream of infected animals. It is insoluble in alcohol. It precipitates but does not fix complement with positive serum. It is antigenic and there is some evidence that it neutralizes the bactericidal action of immune serum.

Fraction B is always attached to the cell bodies and does not occur in the free state. It is soluble in alcohol. It specifically precipitates and fixes complement with positive serum. It is also antigenic.

WORK, E. (1957). Biochemistry of the bacterial cell wall.—*Nature, Lond.* 179, 841-847. 62

A review of the subject with the following headings: constituents of cell walls, other structural units, wall formation and the action of penicillin, enzymic breakdown of cell walls, and investigations on the chemical structure of cell walls.—D. S. PAPWORTH.

GLEDHILL, A. W. & NIVEN, J. S. F. (1957). The toxicity of some bacterial filtrates for mice pre-infected with *Eperythrozoon coccoides*.—*Brit. J. exp. Path.* 38, 284-290. [Abst. from survey of paper, p. i.] 63

The authors found that mice infected with *Eperythrozoon coccoides* are abnormally susceptible to infection by *Salmonella typhi-murium*. This was associated with a toxic principle present in culture filtrates of various Gram-negative bacilli. Small doses of purified lipopolysaccharide from some Gram-negative bacilli were lethal only to parasitized mice, and the activity of the culture filtrates was therefore identified with endotoxin.

HALLIWELL, G. (1957). Cellulolysis by rumen micro-organisms.—*J. gen. Microbiol.* 17, 153-165. [Author's summary copied *verbatim*.] 64

The optimal conditions for accurate and reproducible analysis of cellulose hydrolysis by micro-organisms, particularly from the rumen, were determined. Rumen micro-organisms were found to require approximately 50 mg. substrate (cellulose powder) in a 40 hr. incubation at 37° with 1 ml. of rumen liquor, and a total volume of 8 ml., in static vessels. All types of cellulose or simpler substituted derivatives, from soluble carboxymethylcellulose through insoluble cellulose powder to cotton fibres, are nearly quantitatively hydrolysed by mixed rumen micro-organisms. The effect of the inorganic composition of the medium, of anti-bacterial agents (thymol, fluoride, toluene) and of concentration procedures on the cellulolytic activity of rumen micro-organisms was examined. Rumen protozoa appear to play a minor role in cellulose degradation; their effective activity is due mainly to closely associated, possibly ingested, bacteria. The validity of the results obtained by various methods of 'cellulase' assay is discussed.

DISEASES CAUSED BY PROTOZOAN PARASITES

MENON, P. B. (1957). The incidence of surra and tabanid flies in Rajasthan.—*Indian J. vet. Sci.* **27**, 1-16. 65

M. surveyed the incidence of surra (*Trypanosoma evansi* infection) from hospital records in Rajasthan, a State which contains about 75% of all the camels in India. Specimens of *Tabanus rubidus*, *T. striatus* and *T. macer* were collected for the first time from various localities in the State. Flies collected from a tank in Jaipur, and the hymenopterous insects parasitizing eggs presumably of the same flies, were identified at the Commonwealth Institute of Entomology as *Atylotus* sp. and *Centrodora* sp., respectively.

—R. N. MOHAN.

EVENS, F., NIEMEGER, K. & PACKCHANIAN, A. (1957). Chemotherapy of *Trypanosoma gambiense* and *Trypanosoma rhodesiense* infections in guinea pigs with nitrofurazone.—*Amer. J. trop. Med. Hyg.* **6**, 658-664. 66

A single i/m inj. of 50-150 mg./kg. body wt. cured 16 out of 32 g. pigs with chronic *T. gambiense* and suppressed infection in the remainder. Treatment a month after infection gave better results than after 3-5 months. The drug was not as effective in subacute *T. rhodesiense* infection.—R.M.

FULTON, J. D. & GRANT, P. T. (1956). Experiments on the mode of action of stilbamidine.—*Ann. trop. Med. Parasit.* **50**, 381-384. 67

After *Trypanosoma rhodesiense* had been exposed *in vitro* to stilbamidine for two hours it caused a transient infection in rats. About 5 µg. of the drug per µg. of nitrogen was taken up by the trypanosomes and about 7 µg. of absorbed drug was carried over into the rat by the inoculation of the treated trypanosomes. This is, therefore, the maximum amount of the drug available to the host for conversion to a trypanocidal metabolite. Some of it was probably irreversibly bound to the parasite. When a lightly infected animal was given 20 µg. of the drug intravenously the course of the infection was unaltered; 50 µg. had only a slightly suppressive action. The trypanocidal action was probably a direct one and this would account for the absence of enhanced activity either in liver homogenate incubated with the drug or in the serum of rats that had been dosed.—W.A.P.

TERRY, R. J. (1957). Antibody against *Trypanosoma vivax* present in normal cotton rat serum.—*Exp. Parasit.* **6**, 404-411. [Author's summary modified.] 68

Cotton rats are completely resistant to

infection with *T. vivax*. A factor in the serum at low titre agglutinates and lyses the trypanosomes and appears to be specific for *T. vivax*. Five other species of trypanosomes were not affected by cotton rat serum. *T. vivax* was not affected by any other mammalian sera. The factor is non-dialysable and is inactivated by heating to 64°C. for half an hour; electrophoretic separation indicates that the factor is associated with the β- and the faster-moving γ-globulins. It is suggested that this factor is a globulin, produced without external stimulus, whose fortuitous construction is such that it reacts with *T. vivax* antigen.

GREWAL, M. S. (1957). The life cycle of the British rabbit trypanosome, *Trypanosoma nabiasi* Railliet, 1895.—*Parasitology* **47**, 100-118. [Abst. from author's summary.] 69

This work was carried out with a strain of trypanosomes isolated by inoculation into domestic rabbits of fleas naturally infected from wild rabbits in Hertfordshire. The course of infection was studied in normal and splenectomized rabbits, in which the incubation period varied from 5 to 12 days. After recovery from the infection, rabbits became immune to reinfection. Immune rabbit serum had no protective action against *T. lewisi*.

Young rabbits were more susceptible to infection and their parasitaemia lasted longer than in adults, but the parasite was found to be non-pathogenic to these animals.

The development in the intermediate host takes place in the gut of the rabbit flea, *Spilopsyllus cuniculi*, with the production of metacyclic trypanosomes in the hind-gut (posterior station).

The nomenclature and synonymy of the rabbit trypanosome are discussed, and it is concluded that its valid name is *Trypanosoma nabiasi* Railliet, 1895.

LAING, J. A. (1956). *Trichomonas foetus* infection of cattle. F.A.O. Agricultural Studies No. 33. pp. 39. Rome: Food and Agricultural Organisation of the United Nations. 70

A useful review of current knowledge and practice.—R.M.

SENZE, A., SAMBORSKI, A. & BORKOWSKI, B. (1957). Leczenie rzęsiestnicy u buhajów własną metodą. [Treatment of trichomoniasis in bulls.]—*Méd. vét., Varsovie* **13**, 335-336. [In Polish. English and Russian summaries.] 71

Out of 25 bulls treated 19 were cured with one treatment, 5 with 2 treatments and 1 bull

had to be excluded from the experiment. The treatment consisted of washing the penis and prepuce with warm water, drying, washing again with ether, followed by 1% solution of trypanflavine and applying 0.5% trypanflavine ointment. The urethra was flushed with 50 ml. of 0.8% trypanflavine.—M. GITTER.

DELAPPE, I. P. (1957). **Effect of inoculating the chicken and the turkey with a strain of *Trichomonas gallinarum*.**—*Exp. Parasit.* **6**, 412-417. [Author's summary modified.] **72**

A strain of *Tr. gallinarum* isolated from a turkey produced no symptoms or lesions when administered orally to chickens and turkey poults.

DAVIS, L. R. & BOWMAN, G. W. (1957). **The endogenous development of *Eimeria zurui*, a pathogenic coccidium of cattle.**—*Amer. J. vet. Res.* **18**, 569-574. [Authors' summary modified.] **73**

Sporulated oocysts of *E. zurui* were administered to 14 calves that were killed between 2 and 20 days later. In fresh smears and tissue sections, schizonts were first seen at 2 days and were still observed as late as 19 days after infection. They were found in the upper, middle, and lower portions of the small intestine and in the caecum and colon. Mature schizonts had between 24 and 36 merozoites and were about 9.6 by 13.2 μ in size. Merozoites, first found after 7 days, were between 5.4 and 12.2 μ in size. They were in the small intestine, caecum, colon, and rectum. Macrogametocytes, about 10.6 by 13.5 μ , were identified after 12, 14, 15, and 19 days, mostly in the lower small intestine, caecum, colon, and rectum, with the exception of two found in the upper small intestine. Microgametocytes were found only after 15 and 19 days, and were about 9.7 by 13.8 μ at 19 days. The microgametes were small, densely stained, comma-shaped bodies, arranged peripherally in mature microgametocytes. There were fewer microgametocytes than macrogametocytes. Immature oocysts were first apparent after 12 days. They were found in the caecum and colon, with a few in the lower small intestine.

MARQUARDT, W. C. (1957). **The effect of temperature on the sporulation of *Eimeria zurui* of cattle.**—*J. Prot.* **4**, Suppl. p. 10. [Only abst. given. Abst. from abst.] **74**

Complete sporulation is first seen at 12°C. in 240 hours, at 15° in 144 hours, at 20° in 72 hours, at 25° in 40 hours, at 30° in 23 hours and at 32.5° in 24 hours. Sporulation is morphologically abnormal and partially inhibited at

35° and 37°C. Sporulation is completely inhibited at 39°C. Exposure up to 12 hours at 35° to 39°C. does not generally injure the oocysts. Incubation for 24 hours at 37°C. reduces by 50% the oocysts capable of sporulating normally. The effect of fluctuating temp. was studied by holding oocysts alternatively at 5° and 20°C. When the time to complete sporulation was expressed on the basis of total time at 20°C., it was seen that fluctuating temp. caused no fundamental change in the rate of sporulation.

SENGER, C. M., HAMMOND, D. M. & THORNE, J. L. (1957). **Experimental studies on resistance of calves to reinfection with *Eimeria bovis*.**—*J. Prot.* **4**, Suppl. p. 11. [Authors' abst. modified.] **75**

The occurrence and duration of acquired resistance to experimental *E. bovis* infection was investigated in 3 experiments, each involving 16 to 25 calves. The animals received an immunizing dose of 10,000 to 100,000 sporulated oocysts. A challenge dose of 0.5 to 3 million oocysts was administered 14-100 days later. An immunizing dose of 50,000 oocysts usually produced only mild symptoms, whereas 100,000 oocysts usually caused severe symptoms. Resistance was revealed by marked differences in oocyst counts, duration of diarrhoea and discharge of bloody faeces. Calves which received an immunizing dose of 50,000 or 100,000 oocysts either exhibited mild symptoms or appeared unaffected by the challenge dose. No marked difference in resistance resulted from a single dose of oocysts as compared with the same number divided into 5 doses given on successive days. Calves challenged 28 days after administration of the immunizing dose were more resistant than those challenged at 14 days. Resistance was still present after 3 months, but had decreased.

MARTHEDAL, H. E. & VELLING, G. (1957). **The effect of nicarbazin and the synergism between sulphonamides (sulphabenzpyrazine and sulphadimidine) and pyrimethamine on caecal coccidiosis experimentally produced in chickens.**—*Nord. VetMed.* **9**, 373-389. [In English, German and Danish summaries.] **76**

Chickens, 3-7 weeks old, were used. Nicarbazin, 0.0125% in the food for 6-7 days from the time of infection with 70 to 80,000 sporulated oocysts of *E. tenella*, had a decided coccidiostatic effect, the disease running a milder course; this treatment was much less effective when started 48 or 72 hours after infection. The drug did not interfere with the development of immunity. Nicarbazin gave better results than sulphabenz-

pyrazine (0.012% in the food). Sulphabenzpyrazine (0.01%) plus pyrimethamine (0.0025%) was effective when given 24 hours after the infection, but did not protect completely against massive infection when given after a delay of 48 hours. Sulphadimidine (0.05%) plus pyrimethamine (0.005% or 0.0025%) had a temporary coccidiostatic effect. It was concluded that nicarbazin can be recommended as a prophylactic although it is not curative. Further work on the synergism of sulphonamides and pyrimethamine is considered necessary for determination of dosage.—F.E.W.

POLIN, D., GILFILLAN, J. L., OTT, W. H. & PORTER, C. C. (1956). 4,4'-Dinitrocarbanilide in egg yolks from hens fed nicarbazin.—*Poult. Sci.* **35**, 1367-1371. **77**

A component of nicarbazin, 4,4'-dinitrocarbanilide, was present in egg yolk in a conc. proportional to that of nicarbazin in the food. After fowls had fed for 10 days on a diet containing 0.001% nicarbazin, each gramme of the yolk of their eggs contained about 1.6 µg. of the component.—R.M.

TSUNODA, K. (1954). Destruction of coccidian oocysts of chicken by means of chemicals.—*Abstr. Proc. Suiyokai, Tokyo*, 1956. pp. 31-32. [In English.] **78**

Fresh unsporulated oocysts of *Eimeria tenella* were exposed to the effect of nine derivatives of 2,4-dinitro-6-cyclohexylphenol and four derivatives of dichlorobenzene. 2,4-Dinitro-6-cyclohexylphenol, its acetate, its dibutylamine, 2,4-dinitro-*o*-cresol and its dibutylamine, and *p*-chlorophenyl-*p*-chlorobenzene sulphone ester all had high activity in killing oocysts.

—S. BRIAN KENDALL.

TSUNODA, K. (1954). Anticoccidial activities of dialkyl dithiocarbamates.—*Abstr. Proc. Suiyokai, Tokyo*, 1956. pp. 32-33. [In English.] **79**

Of a number of compounds tested for coccidiostatic effect against *Eimeria tenella* in young chicks, tetramethylthiuram disulphide is stated to have been the most effective and to have been comparatively low in toxicity. Sodium and ferric dimethyldithiocarbamates also were effective. The effective compounds are stated to have specific activity against sporozoites, little effect against 1st generation schizonts and very little or no effect against 2nd generation schizonts.

—S. BRIAN KENDALL.

MANWELL, R. D., WEISS, M. L. & SPANDORF, A. A. (1957). Effect of splenectomy on

elongatum and *circumflexum* malaria in ducks.—*Exp. Parasit.* **6**, 358-366. [Authors' conclusions modified.] **80**

The innate resistance of ducks to infection with *Pl. circumflexum* was not weakened by removal of the spleen. Splenectomy in ducklings under 3 weeks old resulted in severer *Pl. elongatum* malaria, as evidenced by higher and more prolonged parasitaemia. Splenectomy in older ducks nullified their age resistance to *Pl. elongatum*, but had little effect on acquired immunity. About 5% of ducklings appeared to have an innate immunity to *Pl. elongatum* which splenectomy did not affect. Incomplete removal of the spleen was followed by regeneration, and gradual recovery from the infection. The ratio of spleen weight to body wt. in ducks is at its greatest at about 20 days of age, when age resistance to *Pl. elongatum* increases.

SIMIĆ, Č., NEVENIĆ, V. & ŠIBALIĆ, S. (1956). [Treatment of ovine and bovine piroplasmiasis with "Berenil".]—*Acta vet., Belgrade* **6**, No. 2. pp. 3-12. [In Serbian. French summary.] **81**

Rapid recovery was observed in 161 out of 169 sheep with *B. ovis* infection, following a single i/m inj. of "Berenil" [*V.B.* **26**, 1218] at 3 mg./kg. body wt. The lethal dosage was 10 mg./kg. Not all the parasites were killed by a single treatment, even at toxic dosages. Treatment of 140 cattle with *B. bovis* infection and 3 with *B. bigeminum* infection was similarly successful at a dosage of 3 mg./kg., although severe cases required 2 or 3 doses; the drug was safe for young cattle.—R.M.

MAHMOUD, A. H., HAIBA, M. H., ZAFER, S. A. W. & AWAD, F. I. (1956). Die Wirksamkeit von Berenil bei subklinischen Fällen von Theileriose bei Rindern und Büffeln. [Effect of "Berenil" in subclinical theileriosis in cattle and buffaloes.]—*Z. Tropenmed. u. Parasit.* **7**, 282-285. [English summary.] **82**

Berenil, injected i/m in doses of 7-10 mg./kg. body wt. into 7 cows with subclinical *Theileria annulata* infection, removed the parasite from the blood stream. In 6 buffaloes and 4 buffalo calves similar results were obtained when the dose was raised to 10-12 mg. There were local reactions in both cattle and buffaloes. In some animals food intake and milk production were temporarily reduced, but no grave toxic symptoms were observed.—E.G.

ROTH, W., WERTHEMANN, A. & HESS, R. (1957). Postnatale und intrauterine experimentelle Infektion des Kaninchens mit einem

abgeschwächten Stamm von *Toxoplasma Gondii*. [**Postnatal and intra-uterine infection of rabbits with *T. gondii***.]—*Schweiz. Z. allg. Path.* **20**, 257-280. [English and French summaries, Abst. from English summary.] **83**

Intranasal inoculation of an attenuated strain of *T. gondii* was followed in the adult animal by transitory interstitial pneumonia, a

See also absts. **224** (paper-electrophoresis in toxoplasmosis and dog distemper); **313** (book, cattle diseases).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

REHM, W. (1956). Untersuchungen über die Hämagglutination bei Maul- und Klauenseuche. [**Hæmagglutination in foot and mouth disease**.]—*Inaug. Diss., Hanover* pp. 28. **84**

Hæmagglutination-inhibition tests for F. & M. disease were not specific, even after removal of non-specific hæmagglutinins from the sera under test. [See also *V.B.* **22**, 2458.]—R.M.

BLANC, R. A. & UROZ, J. (1956). Conservacion de suero antiaftoso hiperimmune para la reaccion de fijacion del complemento (sueros congelados, fenicados, merthiolatados y liofilizados). [**Preservation of foot and mouth disease serum for use in complement-fixation tests**.]—*Gac. vet., B. Aires* **18**, 226-232. **85**

Hyperimmune g. pig sera ("O", "A" and "C") stored at -15°C ., treated with 5% phenol, or freeze-dried retained their titres for 180 days. When treated with 1:10,000 merthiolate soln. "O" and "A" retained their titres for 180 days and "C" for 90 days.—T.E.G.R.

ZAHN, G. E. D. (1956). Research on the adaptation of foot-and-mouth disease virus in chicks. — *Thesis, Utrecht* pp. 76. [In English.] **86**

Tissue culture strains of all three types of the virus, and a bovine strain of type O, were transferred in day-old chicks for from 27 to 41 serial passages, by i/m inoculation of suspensions of infected gizzard muscle. Neither bovine strains of types A and C, nor any of the g. pig-adapted strains, were successfully established in day-old chicks. A susceptible ox infected with the 25th chick passage of type O virus derived from cattle, showed only local reaction, and was immune to challenge with the parent virus. In general, the author's findings confirmed those of Skinner [*V.B.* **25**, 1974] and Gillespie [*V.B.* **25**, 3189-90].—R.M.

RICE, C. E. (1957). The differentiation of vesicular diseases by serological procedures. — *Proc. 60th Ann. Meet. U.S. live Stk sanit.*

general spread of infection and a characteristic rising curve of specific antibodies. Transplacental passage of the agent during the first half of the gestation period and the resulting lesions in the foetal organs are described. Similarly inoculated young animals developed foci of encephalitis resembling those occurring in intra-uterine infection with early hæmatogenous dissemination.

Ass., Chicago, 1956 pp. 325-330. [Author's summary modified.] **87**

Some of the problems that arise in *in vitro* differentiation of vesicular diseases in cattle, horses and pigs were described, with particular emphasis on the c.f. test. Certain of the general principles underlying the satisfactory performance of such tests and their modifications were discussed. For the identification of a virus by c.f. tests, standard antisera for the 6 types of F. & M. disease virus, the 2 types of vesicular stomatitis virus and if possible the 5 or more types of vesicular exanthema virus should be available and, where permissible, corresponding standard control antigens. For the detection of antibodies standard antigens are required. This limits the performance of the tests to laboratories where such antigens can be maintained without hazard to livestock outside the laboratory.

SHEN, P. M., ORLOVA, N. N., TUREVICH, S. T., NAZAROV, V. A. & BEZELYUK, M. I. (1957). [**Antibody formation in dogs vaccinated with various types of rabies vaccine**.]—*Voprosui Virusologii* **2**, 156-161. [In Russian. English summary.] **88**

The authors have previously described a dried formolized rabies vaccine, containing calcium phosphate, prepared at the Institute of Virology of the Academy of Medical Sciences in Moscow [*V.B.* **26**, 2594]. In the present paper they demonstrated that it was superior to other vaccines currently used in the U.S.S.R. —R.M.

SCHINDLER, R. (1957). Vergleichende Untersuchungen über das Verhalten von weissen Laboratoriumsmäusen und Feldmäusen (*Microtus arvalis Pallas*) nach Infektion mit Tollwutvirus. [**Behaviour of laboratory mice and field voles after infection with rabies virus**.]—*Z. Tropenmed. u. Parasit.* **8**, 233-241. **89**

Both species of animal were equally susceptible to infection with rabies virus, but symp-

toms were less pronounced (or even absent) in voles than in mice. The saliva of voles contained a higher conc. of virus than that of mice. S. believed that voles were important as carriers of rabies.—R.M.

VAN DEN ENDE, M., POLSON, A. & TURNER, G. S. (1957). **Experiments with the soluble antigen of rabies in suckling mouse brains.**—*J. Hyg., Camb.* **55**, 361-373. [Authors' summary modified.] **90**

A study has been made of the properties of soluble antigen in the brains of infant mice infected intracerebrally with the Flury strain of rabies virus.

Soluble antigen is produced at the same time as infective virus, and reaches a high concentration in a period of 2-3 days. Experimental results suggest that the soluble antigen remains antigenically active after heating at 56°C. and treatment with 0.5% phenol or 0.035% formaldehyde, but that such heating reduces the ability to stimulate formation of neutralizing antibody.

Rabbits and mice appear to differ in the production of neutralizing antibody following immunization against soluble antigen in which residual live virus was inactivated by heat, phenol or formaldehyde. It is suggested that this difference may depend on the different susceptibility to traces of incompletely inactivated virus remaining in the immunizing antigens.

ANDRAL, L. & GENTILE, A. (1956). Une méthode simplifiée de coloration des corps de Negri. [A simplified method of staining Negri bodies.]—*Bull. Soc. Pat. exot.* **49**, 1114-1115. **91**

The fixing fluid of choice is Zenker's soln. The sections are stained with Ziehl's phenolized fuchsin and 1% methylene blue. Grey-matter is coloured pale blue and white matter pink; r.b.c. are carmine and w.b.c. dark blue or violet blue. The nerve cells are bright blue with pale nuclei and very dark blue or violet blue nucleoli. Negri bodies are clearly coloured bright carmine, the depth of the colour varying directly with the compactness of their structure. On the other hand they may appear paler as the inner corpuscles assume a clearer blue coloration. Both these types of Negri bodies may occur in the same preparation.—T.E.G.R.

SALAMAN, M. H. & TOMLINSON, A. J. H. (1957). **Vaccination against mouse-pox: with a note on the suitability of vaccinated mice for work on chemical induction of skin tumours.**—*J.*

Path. Bact. **74**, 17-24. [Authors' summary copied *verbatim*.] **92**

A method is described for routine vaccination of mouse colonies with vaccinal sheep lymph, as a precaution against outbreaks of mouse-pox (ectromelia), and suggestions are made for the control of mouse-pox outbreaks with the aid of vaccination. After successful vaccination mice were almost completely resistant to revaccination for 6 months, and partially resistant for 9 months. The LD50 of injected mouse-pox virus was about 10 times greater in mice vaccinated up to 8 months previously than in unvaccinated mice. No protection was demonstrable 21 months after vaccination. Tumour production in mouse skin by chemical "initiating" and "promoting" stimuli was not significantly affected by vaccination.

HAHON, N., LOUIE, R. & RATNER, M. (1957). **Method of chorioallantoic membrane inoculation which decreases nonspecific lesions.**—*Proc. Soc. exp. Biol., N.Y.* **94**, 697-700. **93**

Details are given of a modified method of inoculation which reduces non-specific lesions due to trauma, thereby increasing the accuracy of titrations and facilitating detection of pock-inducing viruses in diagnostic work which might otherwise be masked by such lesions.—E.V.L.

PARNAS, J., LORKIEWICZ, Z. & SZCZYGIELSKA, J. (1957). **Results of comparative studies on animal virus G₁ and its relation to the human influenza viruses.**—*Bull. Acad. polon. Sci. Cl. II.* **5**, 89-92. [In English.] **94**

Porcine influenza virus G1 was similar in size to human influenza virus; it was spherical and measured approx. 100 mμ. It multiplied in chick embryos, and the amniotic and allantoic fluids agglutinated chick erythrocytes. Experiments with sera from infected pigs and rabbits failed to show any serological relationship between the G1 virus and either the human PR8 or Lee influenza viruses, but a slight interference effect of the G1 virus with the human viruses was demonstrated.—E.V.L.

FINTER, N. B. & ARMITAGE, P. (1957). **The membrane piece technique for *in vitro* infectivity titrations of influenza virus.**—*J. Hyg., Camb.* **55**, 434-456. [Abst. from authors' summary.] **95**

The membrane piece technique for *in vitro* titrations of the infectivity of influenza virus is described. Rectangles of shell, about 8×25 mm., with the chorio-allantoic membrane still attached (membrane pieces) are cut from

thirteenth day fertile eggs. One piece in a test-tube with glucose-buffered salt solution forms an individual assay unit. Five or more tubes are inoculated with each virus dilution. After incubation at 37°C. for 72 hours, with agitation for the first 24 hours the fluid in each tube is tested for haemagglutinins. From the results at each dilution, an estimate of the 50% membrane piece (MP₅₀) infectivity titre is obtained.

Six hundred assay units, with pieces cut from twenty eggs, can be set up by two workers in 1 hour and used for titration of between 3 and 24 individual virus preparations, depending on the reliability desired for the 50% end-point estimates.

NETTER, R. (1956). Enquête sérologique sur l'encéphalite japonaise B au Viet-Nam. I. Recherches chez l'homme. [A serological survey of Japanese B encephalitis in Viet-Nam. I. In Man.]—*Bull. Soc. Pat. exot.* 49, 883-889. 96

NETTER, R., GOUÉFFON, Y. & TRIAU, R. (1956). Enquête sérologique sur l'encéphalite japonaise B au Viet-Nam. II. Recherches chez divers animaux domestiques. [A serological survey of Japanese B encephalitis in Viet-Nam. II. In domestic animals.]—*Ibid.* 889-892. 97

I. H.I. antibodies were demonstrated in about 20% of the population.

II. In a serological survey of animal sera a high percentage of doubtful reactions to the c.f. test was obtained particularly in the case of goats, fowls and wild ducks. The H.I. test is, therefore, considered preferable for these species. The survey was carried out in April-June, i.e., just before the seasonal appearance of the disease among human beings. Antibodies were demonstrated in sera of horses, cattle, dogs and fowls, indicating that the virus is widespread in Viet-Nam.—T.E.G.R.

DAUBNEY, R. & MAHLAU, E. (1956). Near-eastern equine encephalomyelitis. Joint FAO/OIE Meeting on the control of tickborne diseases of livestock, Rome, 23-27 July, 1956. Rome: Food and Agricultural Organisation of the United Nations. FAO/56/7/5351. pp. 21. 98

Sporadic outbreaks of equine encephalomyelitis in Egypt and Syria were studied. Strains of virus were isolated from the brain of 4 of 12 affected horses and from *Hyalomma excavatum* by subdural or intracerebral (i/c) inoculation into rabbits. The strains were passaged in rabbits, the incubation period being

usually between 6 and 26 days. One strain killed day-old chicks inoculated i/c, and was passaged in chick embryos. Attempts to reproduce the disease in horses, sheep, goats and rats failed, and g. pigs were apparently resistant to infection. Virus was isolated from cats fed brain material from infected horses and from some wild birds shot in an affected area. It passed Chamberland L5, L7 and L11 filters. Symptoms and lesions in horses were described. —R.M.

I. KISSLING, R. E., STAMM, D. D., CHAMBERLAIN, R. W. & SUDIA, W. D. (1957). Birds as winter hosts for eastern and western equine encephalomyelitis viruses.—*Amer. J. Hyg.* 66, 42-47. 99

II. KISSLING, R. E., CHAMBERLAIN, R. W., SUDIA, W. D. & STAMM, D. D. (1957). Western equine encephalitis in wild birds.—*Ibid.* 48-55. [Authors' summaries modified.] 100

I. Blood collected from wild birds in winter in the southern States of the U.S.A. and from migrating birds entering this country in spring failed to yield isolates of the arthropod-borne encephalitides. The results of antibody studies on these birds indicate the presence of stationary foci of infection for eastern equine encephalitis virus.

II. Six species of wild birds common in the southeastern part of the U.S.A. were found to be susceptible to western equine encephalitis virus. Virus circulated in their blood in concentrations adequate for the infection of *Aedes triseriatus* and *A. aegypti* mosquitoes, and these were able to transmit infection by their bite to normal birds. Evidence of virus multiplication and possible transovarian passage of virus in mosquitoes is presented. Factors in nature which might be important in preventing western equine encephalitis from becoming an epidemic disease in the eastern part of the country are discussed.

KOLYAKOV, Y. E. & PICHUGIN, L. M. (1956). [Experimental causation of liver lesions occurring in equine infectious encephalomyelitis in laboratory animals.]—*Trud. mosk. vet. Akad.* 12, pp. 192-206. [In Russian.] 101

Liver lesions considered to be characteristic for Russian equine encephalomyelitis consisted of dystrophy with disorganization of trabecular structure of lobules, cell infiltration, and eventual fatty degeneration. In rabbits, identical lesions were found after infection with clostridia or after i/v inj. of *Cl. welchii* Types B and D

toxins. Thus the liver lesions in horses were probably caused by the toxins of anaerobes in the intestine and were not specific for the virus.

—R.M.

RADOMIŃSKI, W. & BOSKI, A. (1957). Próby zastosowania odczynu wiązania dopełniacza w rozpoznawaniu niedokrwistości zakaźnej koni. I. Badanie nad specyficznością o.w.d. wg Altara'y, Serra'y, Guarini'ego. [**Diagnosis of equine infectious anaemia by the complement-fixation test. I. Specificity of the method described by Altara, Serra and Guarini.**]—*Méd. vét., Varsovie* **13**, 325-330. [In Polish. English and Russian summaries.] **102**

The authors used the complement-fixation test on 221 serum samples from 186 horses (105 apparently healthy and 81 suspected of E.I.A.). They concluded that the test, especially in conjunction with liver biopsy, is a useful aid to diagnosis of chronic and latent cases of E.I.A. [See *V.B.* **27**, 2379].—M. GITTER.

NIKOLIĆ, B., ŠEBETIĆ, Č., STOŠIĆ, N. & MILANOVIĆ, N. (1956). [**Properties of horse serum treated with heat and sodium chloride.**]—*Acta vet., Belgrade* **6**, No. 3-4, pp. 33-44. [In Serbian. English summary.] **103**

In the c.f. test for equine infectious anaemia described by Altara *et al.* [*V.B.* **24**, 3140], 1.5% NaCl soln. is added to the serum under test to inactivate complement. The present authors demonstrated that this procedure did not inactivate complement.—R.M.

GUARINI, G. & AMBROSINO, C. (1957). Nuove ricerche sul sangue dei cavalli colpiti da anemia infettiva. [**Study of the serum of horses with equine infectious anaemia.**]—*Atti Soc. ital. Sci., Perugia*, 1956 **10**, 681-685. [English and French summaries.] **104**

A heat stable antigen and a heat labile antibody were demonstrated in serum samples of infected horses by electrophoresis and by salting. The latter method is valuable for the separation of the two elements and for the interpretation of false negative reactions in the modified c.f. test [*V.B.* **24**, 3140].—T.E.G.R.

FOSCHI, M. (1957). Il comportamento della formula leucocitaria e dello schema di Arneth in alcuni casi di anemia infettiva del cavallo. [**The leucocyte picture in equine infectious anaemia.**]—*Atti Soc. ital. Sci., Perugia*, 1956 **10**, 686-689. [French and German summaries.] **105**

The blood picture in 4 cases of chronic

equine infectious anaemia was studied. It is considered that the w.b.c. count and Arneth's formula are of value in diagnosis and prognosis of chronic infection.—T.E.G.R.

SCHMIDT, D. & MATTHIAS, D. (1956). Untersuchungen über die Beziehungen der Bilirubinbildung zum Blutabbau bei der infektiösen Anämie des Pferdes. [**Relationship of bilirubin formation to haemolysis in equine infectious anaemia.**]—*Arch. exp. VetMed.* **10**, 895-915. **106**

The expected increase in bilirubin in the blood, characteristic of haemolytic anaemia, did not occur in horses with acute infectious anaemia. There was, however, a large increase in blood pigment which spectrophotometric examination revealed as being due to an increase in haemoglobin. The possible causes of this apparent inhibition of bilirubin formation and also the relationship between haemolysis and the presence of erythrocytic inclusions were discussed.—R.M.

BINDRICH, H. (1956). Beobachtungen bei experimenteller Übertragung des Virus der infektiösen Anämie der Pferde. [**Observations during experimental transmission of the virus of equine infectious anaemia.**]—*Arch. exp. VetMed.* **10**, 702-708. **107**

Inoculation of horses with equine infectious anaemia virus which had undergone up to 7 intratesticular passages in foals suggested that the testes have an attenuating effect on the virus. The tonsils of 4 foals, although swollen, were free from virus on the 2nd, 4th, 6th, and 8th days after administration of the virus in the food. Bone marrow and blood contained the virus at a fairly high titre in the prefebrile phase of the disease. However, the end titre of the virus at different stages of the disease was always lower in the bone marrow than in the blood.

—M.G.G.

RANDALL, C. C. & BRACKEN, E. C. (1957). **Studies on hepatitis in hamsters infected with equine abortion virus. I. Sequential development of inclusions and the growth cycle.**—*Amer. J. Path.* **33**, 709-727. [Authors' summary modified.] **108**

A study of the morphological changes occurring in hepatic parenchymal cells of the hamster following infection with equine abortion virus. At 3 hours the nuclei showed disarrangement of the chromatinic network and small accumulations of inclusion material appeared. With the development of the infection, there

was progressive accumulation of Feulgen-positive material, filling the majority of nuclei in 9 to 12 hours. Subsequently, there was little change in the morphological detail. The virus content of blood and liver reached a maximum from 9 to 12 hours, concomitant with the development of nuclear changes.

FURUTANI, T., NAKAMURA, H., ISHII, S. & KURATA, K. (1956). [Studies on rinderpest virus neutralization methods with embryonating chicken eggs.]—*Bull. nat. Inst. Anim. Hlth* No. 31 pp. 39-46. [In Japanese. Abst. from English summary.] 109

Intravenous inoculation of chick embryos gave more reliable results in neutralization tests than inoculation into the yolk sac.—R.M.

FLOWRIGHT, W. (1957). Recent observations on rinderpest immunisation and vaccines in Northern Nigeria.—*Brit. vet. J.* 113, 385-399. [Author's summary slightly modified.] 110

Certain difficulties in rinderpest immunization in Nigeria are discussed. Data are presented on the reaction of local zebu (White Fulani) cattle to the inoculation of goat-adapted virus under favourable laboratory conditions. Lapinized virus consistently immunizes these cattle, and estimations are given for the I.D.₅₀ and "vaccinal" dose of vaccine. The wide variability in reaction of Northern Nigerian zebu cattle to lapinized virus is discussed in relation to the titration of this and similar attenuated rinderpest viruses in cattle.

PIERCY, S. E. & WITCOMB, M. A. (1957). Laboratory trials with an avianised rinderpest vaccine.—*Brit. vet. J.* 113, 353-366. [Authors' summary modified.] 111

Experiments with a Japanese strain of avianized rinderpest virus are described. Reconstituted whole egg vaccine suffered no appreciable loss of titre when kept for 6 hours at room temp. (20°C.); after 24 hours a 2 log. drop occurred. Storage at 30°C. (86°F.) for 2 or 6 hours resulted in a fall of not more than 1 log. At 40°C. (105°F.) the titre fell by 1 log. after 1 hour and by 2 log. after 3 hours. Dried whole egg vaccine lost 1 log. in titre after storage for 7 days at 30°C., 1½ log. after 10 days at room temp. and half a log. after 9 months at -25°C. Of all the animals immunized with dried vaccine at a dilution of 10⁻³, which is 10 times more dilute than the suggested field dose, 80% showed a significant thermal response. A method for the production of large quantities of cheap, dried avianized rinderpest vaccine is

described. Ten infected fertile eggs can provide doses for 10,000 cattle, each containing 100 M.I.D.

GILLESPIE, J. H., LEE, K. M. & BAKER, J. A. (1957). Infectious bovine rhinotracheitis.—*Amer. J. vet. Res.* 18, 530-535. [Authors' summary modified.] 112

Infectious bovine rhinotracheitis virus was maintained in bovine kidney cells for 100 passages. It was cytopathogenic. Rises in temp. lasting 2-6 days were induced within 18 to 36 hours when virus was given intratracheally to calves, and within 72 to 120 hours when given intranasally. Contact infection was observed. Infected calves also showed salivation, lachrymation, inappetence, and depression. They developed neutralizing antibodies and were later immune. In calves inoculated intranasally, the virus concentration was greatest in nasal exudate. Calves inoculated intratracheally showed a high conc. initially in the lungs and later in nasal mucosa. After intranasal inoculation, virus appeared in nasal mucus the following day in low conc. and gradually increased, reaching its highest titre 5 days after inoculation. Virus was not recovered in nasal exudate after 22-60 days. Neutralizing antibodies were found in pooled sera from 5 out of 43 dairy herds in New York, and in serum collected from a calf in New Jersey in 1941. The disease probably occurs in eastern parts of the U.S.A. and has been there for a long time.

CABASSO, V. J., BROWN, R. G. & COX, H. R. (1957). Infectious bovine rhinotracheitis (IBR). I. Propagation of virus in cancer cells of human origin (HeLa).—*Proc. Soc. exp. Biol., N.Y.* 95, 471-476. [Authors' summary modified.] 113

Using alternating passage between HeLa and bovine embryo kidney cultures, infectious bovine rhinotracheitis virus was adapted to HeLa cells and propagated through 26 serial transfers. The adapted virus rapidly destroyed HeLa cells and yielded, when measured in bovine kidney cell cultures, virus titres comparable to those of virus grown in bovine kidney. It was specifically neutralized by an immune g. pig serum prepared against virus grown in bovine kidney and, although somewhat less virulent for calves than the parent virus, it induced a comparable level of neutralizing antibodies in all animals and afforded them a solid protection against a virulent challenge.

YORK, C. J. & SCHWARZ, A. J. F. (1957). Immunological studies on infectious bovine rhinotracheitis.—*Proc. 60th Ann. Meet. U.S.*

live Stk sanit. Ass., Chicago, 1956 pp. 149-154. [Authors' summary modified.] 114

The virus of infectious bovine rhinotracheitis propagated in bovine embryo kidney tissue culture reproduced the disease experimentally. Serum neutralization tests in tissue culture and cross protection tests in cattle yielded further proof that the tissue culture virus is the cause of the disease. All the strains of virus isolated so far appear to be immunologically the same. One strain was so modified by tissue culture that, after i/m inoculation in cattle, there were no signs of illness but immunity developed. Furthermore, the virus did not spread by contact from inoculated to susceptible cattle. A safe, effective, live virus vaccine is now being produced.

TAKEMATSU, M., SASAHARA, J., CHIKATSUNE, M. & OKAZAKI, K. (1956). [Immunological experiments on bovine epizootic fever.] — *Bull. nat. Inst. Anim. Hlth* No. 31. pp. 25-33. [In Japanese. Abst. from English summary.] 115

The authors studied a virus isolated from the blood of cattle with an influenza-like disease prevalent in Japan in 1948-50 [see also *V.B.* 25, 1009]. The virus was easily transmitted to and passaged in cattle by i/v inoculation, but not lab. animals or chick embryos. Symptoms of experimental infection were high fever, anorexia, dyspnoea, digestive disturbances, muscular spasms and stiffness of the leg joints. Blood kept at -40°C . remained infective for 958 days. An immune serum was obtained, of which about 150 ml. protected cattle from 10 m.l.d. of virus inoculated 24 hours or 2 weeks later.—R.M.

MORAILLON, P. (1957). Avortement à virus de la brebis. Relation de cinq enzooties. [Virus abortion in ewes : account of five outbreaks.] — *Rec. Méd. vét.* 133, 379-389. 116

Five outbreaks of virus abortion in ewes in northern France are described. Treatment of pregnant ewes with 250 mg. terramycin in tablet form placed in the anterior vagina gave encouraging results.—H. SCOTT McTAGGART.

ZLOTNIK, I. (1957). Significance of vacuolated neurones in the medulla of sheep affected with scrapie.—*Nature, Lond.* 180, 393-394. 117

A group of 10 sheep with advanced clinical natural scrapie and a control group of 10 healthy sheep were used in this study. Eighteen serial sections from each of 3 levels in the medulla, totalling 54 sections in each brain, were examined; the average number of vacuoles per

section varied from 22 to 108 in the diseased sheep and from 0.05 to 1.05 in the healthy animals, though one section from a healthy sheep contained a total of 7 vacuoles. Z. emphasized that the finding of even 7 vacuoles in a single section alone was not significant and for the diagnosis of scrapie there must be vacuoles in increased numbers in serial sections throughout the medulla.—E.V.L.

TRUMIĆ, P., ERCEGOVAC, D. & TURUBATOVIĆ, R. (1956). [Immunity to swine fever following simultaneous inoculation of serum and crystal violet vaccine. II.] — *Acta vet., Belgrade*. 6, No. 3-4, pp. 3-22. [In Serbian. German summary. For part I, see *V.B.* 25, 4036.] 118

The authors no longer recommended simultaneous inoculation with swine fever immune serum and crystal violet vaccine for protection of pigs during an outbreak of the disease. Serum alone or vaccine alone (10 ml. by i/m inj.) was suitable for this purpose: various routes of administration and dosages of these preparations were tested.—R.M.

TURUBATOVIĆ, R., BELIĆ, L. & PANJEVIĆ, D. (1956). [Protein content of the blood in pigs before and after immunization against swine fever.] — *Acta vet., Belgrade*. 6, No. 3-4, pp. 57-67. [In Serbian. German summary.] 119

A study by paper electrophoresis of serum proteins during immunization with crystal violet vaccine.—R.M.

DUNNE, H. W., BENBROOK, S. C., SMITH, E. M. & RUNNELLS, R. A. (1957). Bone structure changes in pigs infected with hog cholera.—*J. Amer. vet. med. Ass.* 130, 260-265. 120

Pigs from non-immune sows were experimentally infected at 8 weeks of age with swine fever, the resulting reactions being classed as acute, subacute and chronic. Bone structure changes were observed in the ribs. In acute cases the lesions occurred at the costochondral junction and showed an irregular epiphyseal line with an adjacent narrow transverse line of haemorrhage. In pigs with subacute infection there was marked widening of the epiphyseal line by an increased number of cartilage cells with enlarged lacunae, and the ribs of chronically infected pigs had dense osseous transverse lines proximal to the epiphyseal disk.—E.V.L.

FRANCETIĆ, M. & JEMRIĆ, K. (1957). Količina mokraćevine kao indikator, da meso potječe od životinje saklane iz nužde zbog bolesti. [Urea content of muscle as indicator of health

or disease at time of slaughter. I. Urea levels in healthy pigs and in pigs used for swine fever virus production.]—*Vet. Archiv.* 27, 149-156. [In Croat, English and French summaries.] 121

The average urea content of pork from healthy pigs during the first 48 hours after slaughter was 10.2 ± 0.6 mg. % with a standard deviation of 6.9 ± 0.4 , as compared with 54.3 ± 2.2 mg % with a standard deviation of 28.3 ± 1.6 in pigs slaughtered on the sixth day after infection with swine fever virus. It was concluded that fresh pork containing 31 mg.% of urea may be considered to have been derived from a diseased animal. The value of these findings for the determination of health or disease at the time of slaughter was discussed.—E.G.

PEHL, K. -H. & GRALHEER, H. (1956). Untersuchungen zur Größenbestimmung des Schweinepestvirus durch Ultrafiltration. [Determination of the size of swine fever virus by ultrafiltration.]—*Arch. exp. VetMed.* 10, 699-701. 122

Swine fever virus was estimated to be 15-25 $m\mu$ in size by ultrafiltration with gradocol membranes.—M.G.G.

DETRAY, D. E. & SCOTT, G. R. (1957). Blood changes in swine with African swine fever.—*Amer. J. vet. Res.* 18, 484-490. [Authors' summary modified.] 123

Pigs infected with African swine fever developed leucopenia 4 days later; this was associated with an increase in the percentage of neutrophils, especially the juvenile forms, and a decrease in the percentage of lymphocytes, and was indistinguishable from the leucopenia associated with swine fever. The erythrocyte counts, haemoglobin values, packed cell volumes, and percentages of eosinophiles, basophiles, and monocytes remained normal. Sedimentation rates were erratic.

SCHLEGEL, H. -L. (1955). Die ansteckende Schweinelähme in Europa. Eine geomedizinische Studie zur Herstellung einer Seuchenkarte für die ansteckende Schweinelähme. [Distribution of Teschen disease in Europe.]—*Inaug. Diss., Hanover* pp. 97. 124

The geographical and seasonal incidence of the disease was assessed from the statistics of the International Office of Epizootics and other sources.—R.M.

HECKE, F. (1956). Das Virus, die Epidemiologie und Bekämpfung der ansteckenden Schweinelähmung. [Virus, epidemiology and control

of porcine infectious encephalomyelitis.]—*Arch. exp. VetMed.* 10, 720-737. 125

H. concludes, from a review of the incidence of Teschen disease in Gmünd, Austria, that, in periods lasting several months when no outbreak occurs, the virus must be harboured by symptomless carriers. Such cases of silent infection are probably more common than clinical cases. The disease can therefore only be eradicated from a district by the slaughter of clinically affected herds and vaccination, for a year, of all the remaining herds.—M.G.G.

BANKOWSKI, R. A., PERKINS, A. G., STUART, E. E. & KUMMER, M. (1957). Recovery of new immunological types of vesicular exanthema virus.—*Proc. 60th Ann. Meet. U.S. live Stk sanit. Ass., Chicago*, 1956 pp. 302-320. [Authors' conclusions modified.] 126

Two new immunologically distinct types of vesicular exanthema virus were isolated from pigs fed on swill on a farm where at least 8 outbreaks of the disease were reported in 3 years. The types were designated F₅₅ and G₅₅. A third strain, isolated from asymptomatic slaughter pigs from the same farm 84 days after an outbreak, was described but not classified until more data are available. All 3 strains were characterized by their low pathogenicity for pigs. Thirty susceptible pigs allowed to roam for a month on the farm 7 days after the infected herd had been removed showed no clinical evidence of the disease and were susceptible to the 7 known immunological types of virus. Control by the removal of exposed pigs and the possibility of mutation of the virus are discussed.

HOLBROOK, A. A., GELETA, J. N. & PATTERSON, W. C. (1957). A typing study of vesicular stomatitis virus field samples of swine origin.—*Proc. 60th Ann. Meet. U.S. live Stk sanit. Ass., Chicago*, 1956 pp. 293-301. [Authors' summary modified.] 127

Experimental studies with 12 viruses of the New Jersey type of vesicular stomatitis are reported. Eight were from outbreaks in pigs, and 4 were laboratory viruses. Virus remained viable after 6 years' storage in a dry-ice chest at -70°C . Adult fowls were susceptible to all 12 viruses. The 4 lab. viruses appeared more pathogenic to g. pigs immune to the Indiana type and to 8-day embryonated hens' eggs than were the 8 isolated from pigs. Immunological differences were not sufficient to permit separation into strains. The Missouri strain, which had been kept active by many animal passages, showed greater variations than any of the other

viruses. This study indicates that there is no difference between the virus isolated from pigs and that previously found in cattle and horses.

SCOTT, G. R. (1957). **Notes on animal diseases.**

XI. Virus diseases of pigs.—*E. Afr. agric. J.* **22**, 168-174. **128**

Five virus diseases of pigs occur in Kenya—F. & M. disease, rabies, African swine fever, virus pneumonia and swine influenza. A very mild form of swine pox has also been observed. —M.G.G.

JOHNSON, D. W., CABASSO, V. J., HUFFMAN, K. & STEBBINS, M. R. (1957). **"Atomized" distemper vaccine of avian origin. II. Field experience in mink.**—*Amer. J. vet. Res.* **18**, 668-671. [Authors' summary modified.] **129**

An atomized aqueous distemper vaccine of avian origin, tested in 1,390 mink on 2 farms, elicited complement-fixing antibodies in 68% to 100% of the animals in a single application. A minimum exposure time of 20 sec. per animal was necessary when the vaccine was applied under nitrogen pressure by means of a DeVilbiss 40 nebulizer at a delivery rate of 5 ml. of vaccine in 4-5 min.

MANTOVANI, A. & MASCHERPA, P. (1957). Osservazioni e ricerche sulla eziologia della "hard pad disease" (malattia del piede duro). [Aetiology of hard pad disease.]—*Atti Soc. ital. Sci. vet., Perugia*, 1956 **10**, 701-706. [English summary.] **130**

Neutralization tests for distemper were carried out in two outbreaks of hard pad disease. Antibody titres were low in those cases in which nervous complications and hyperkeratosis were primary, and high in those cases in which these symptoms were secondary to the typical distemper manifestations. It is considered that hard pad disease may be due to various agents which may or may not be immunologically related to distemper virus.—T.E.G.R.

SARKAR, S. (1957). **Immunization of dogs with infectious canine hepatitis virus propagated by tissue culture in swine kidney cells.**—*Thesis, Cornell* pp. 17. **131**

Infectious canine hepatitis virus, after 54 transfers by tissue culture in dog kidney cells followed by 10 passages in pig kidney cells, did not produce disease but conferred immunity in test dogs when inoculated as a dual vaccine in combination with avianized canine distemper virus. Antibody titres, however, produced by tissue cultured virus were lower than those initiated by virulent virus and there was no

significant increase of titre in vaccinated dogs after they were given virulent virus. Susceptible dogs kept in contact with vaccinated dogs did not show disease or develop a neutralizing antibody titre within an exposure period of four weeks and remained fully susceptible to virulent virus.—H. L. GILMAN.

MANTOVANI, A., SIMONELLA, P. & PONZIANI, G. (1957). Sulla infezione sperimentale della volpe rossa (*Vulpes vulpes*) col virus della epatite infettiva del cane. [Experimental canine virus hepatitis in the fox (*Vulpes vulpes*).]—*Atti Soc. ital. Sci. vet., Perugia*, 1956 **10**, 710-716. [French and German summaries.] **132**

The disease was reproduced in 9 of 11 fox cubs inoculated by different routes. In 2 it assumed the form of a simple keratitis; in 1 it was mild while in the remaining 6 it was fatal.

—T.E.G.R.

FONTAINE, M., RICO, A., BRION, A. & GORET, P. (1957). Origine viral d'une rhino-amygdalite contagieuse du chien. [Viral nature of a contagious rhino-tonsillitis in dogs.]—*C. R. Acad. Sci., Paris* **245**, 122-124. **133**

A contagious disease in western and central France, estimated to have affected several thousands of dogs during the past two years, was characterized by tonsillitis and purulent rhinitis. Respiratory and nervous complications occurred. The incubation period was 4 days. It was experimentally reproduced by exposing dogs to an aerosol of filtered tonsil suspension from affected dogs. The causal agent was being studied.—R.M.

WINKLER, W. (1956). Das Blutbild bei experimenteller Myxomatose. [Blood picture in experimental myxomatosis.]—*Arch. exp. VetMed.* **10**, 916-922. **134**

The blood picture was studied in 27 rabbits from the 1st to 9th days after infection. On the 6th day the leucocyte count began to increase, reaching a value 3-4 times normal by the 8th or 9th day. From the 4th day there was lymphopenia and slight neutrophilia. The proportion of juvenile leucocytes increased from the 6th day. The number of eosinophiles remained low throughout.—R.M.

VROLIJK, H., VERLINDE, J. D. & BRAAMS, W. G. (1957). **Virus pneumonia (snuffling disease) in laboratory rats and wild rats due to an agent probably related to grey lung**

virus of mice.—*Leeuwenhoek ned. Tijdschr.* 23, 173-183. 135

A virus which caused pneumonia in mice was isolated from the lungs of 39 of 76 lab. rats and 1 of 2 wild rats with "snuffling disease." Electron microscopy of lung suspensions revealed virus-like particles having a diam. of 200-250 m μ . Chlortetracycline and oxytetracycline had a prophylactic and therapeutic action in infected mice. The properties of the virus were very similar to those of grey lung virus described by Andrewes & Glover [*V.B.* 16, 2474].—R.M.

SINKOVICS, J. (1957). Studies on the biological characteristics of the Newcastle disease virus (NDV) adapted to the brain of newborn mice.—*Arch. ges. Virusforsch.* 7, 403-411. [In English. Author's summary modified.] 136

A Hungarian strain of NDV was very easily adapted to the brain of new-born mice. The adapted virus was unable to grow in the brain of adult mice, showed enhanced tumour-inhibiting activity and diminished pathogenicity for chicks. It was easily neutralized by anti-NDV immune sera. Its growth was inhibited in the brains of new-born mice previously inoculated with egg-adapted virus.

I. BANG, F. B. & WARWICK, A. (1957). The effect of an avirulent and a virulent strain of Newcastle virus (*Myxovirus multifforme*) on cells in tissue culture.—*J. Path. Bact.* 73, 321-330. [Authors' summary modified.] 137

II. HOTZ, G. & BANG, F. B. (1957). An electron-microscope study of chicken macrophages infected with the virus of Newcastle disease (*Myxovirus multifforme*).—*Ibid.* 331-335. [Authors' summary copied verbatim.] 138

I. A virulent strain of virus destroyed fibroblasts, epithelium and macrophages in tissue culture when minimal amounts of virus were inoculated. The avirulent strain of virus destroyed primary explants of fibroblasts when minimal amounts of virus were inoculated. The destruction was followed by regeneration of the fibroblasts even when large amounts of virus were inoculated. Destruction by the avirulent strain was less rapid than by the virulent and was influenced by the amount of virus inoculated.

The virulent virus produced an effect on rat carcinoma cells (WRC 256) grown in human serum similar to that of the avirulent virus on the chick fibroblasts. Rapid regeneration of the cells followed. Minimal amounts of virus had no effect. The avirulent virus grew slowly and relatively poorly in macrophage cultures and

destroyed the cultures only under special conditions. Cultures of macrophages incubated at 34°C. or 37°C. were maintained with the virus surviving and with minimal cell destruction for 80 days. Fluid was replaced three times a week.

II. Thin sections of normal chicken macrophages grown in roller-tube cultures were studied in the electron microscope. These cells have numerous membranous extensions from the surface which surround fluid droplets. The cytoplasm contains numerous granules and tiny vesicles and tubules which are interpreted as part of the endoplasmic reticulum. Mitochondria are numerous and have the usual double membranous cristae. Three strains of Newcastle virus were studied in thin sections of these macrophages. The virus, which was placed on the cells in amounts of about 10,000 infectious units per cell, was not found on the cell surface, but was seen in the ingested fluid droplets within the cell. Destruction of the entire cell substance was apparent at 5 hours and subsequently. No specific lesions were found, nor were the processes of virus multiplication elucidated.

RICHTER, J. H. M. (1956). Een gecombineerde enting tegen kippenpokken en pseudo-vogelpest. [Combined immunization against fowl pox and Newcastle disease.]—Thesis, Utrecht pp. 96. [In Dutch. English summary.] 139

This gives details of work previously published in summarized form [see *V.B.* 27, 1115].—R.M.

SATO, T., SUGIMORI, T., ISHII, S. & MATUMOTO, M. (1955). Infectious bronchitis of chickens in Japan. I. Epidemiological, clinical, and pathological studies and isolation of the causative virus in embryonated eggs. II. Identification of the causative agent as the virus of infectious bronchitis of chickens.—*Jap. J. exp. Med.* 25, 115-131 & 143-150. 140

I. Extensive outbreaks in fowls of all ages, with heavy mortality (30%) among chicks aged 1-2 days, occurred in Tokyo and surrounding prefectures in 1953-54. Egg production was severely affected. The disease was diagnosed as infectious bronchitis on clinical and pathological grounds. It was reproduced in chickens by intratracheal injection of material from infected birds and a virus was isolated on 8 to 10-day-old chick embryos. Suspensions of this virus reproduced the disease in healthy birds; recovered birds were resistant.

II. The virus was identified as the causal agent of infectious bronchitis by means of pathogenicity tests, on chick embryos and fowls, and neutralization tests.—T.E.G.R.

BROADFOOT, D. I., POMEROY, B. S. & SMITH, W. M., JR. (1956). **Effects of infectious bronchitis in baby chicks.**—*Poult. Sci.* **35**, 757-762. 141

Groups of chicks aged 1-18 days were experimentally infected with a field strain of infectious bronchitis virus. Non-layers from these groups were examined P.M. and 3 types of permanent abnormality were noted: non-patent oviduct; patent, underdeveloped oviduct; or cysts in the wall of the oviduct or in the supporting ligament. Incidence of abnormal oviducts generally varied inversely with the age at which the chicks were infected. These findings were in agreement with those observed in previous field cases. During life non-layers appeared normal.—T.E.G.R.

YATES, V. J. & FRY, D. E. (1957). **Observations on a chicken embryo lethal orphan (CELO) virus.**—*Amer. J. vet. Res.* **18**, 657-660. [Authors' summary modified.] 142

Seven strains of a viral agent which produced consistent lesions and death patterns were isolated from chick embryos that had been inoculated with various tissues or exudates treated with streptomycin. They were not related serologically to the agents of infectious bronchitis, Newcastle disease, laryngotracheitis, fowl pox and avian encephalomyelitis. Neutralizing antibodies against the virus were found in the sera of fowls from some of the major poultry-producing areas of the U.S.A.

TUMLIN, J. T., POMEROY, B. S. & LINDORFER, R. K. (1957). **Bluecomb disease of turkeys. IV. Demonstration of a filterable agent.**—*J. Amer. vet. med. Ass.* **130**, 360-365. 143

Bluecomb disease was produced in day-old poults by oral inoculation of infected intestinal material, which had been filtered through sintered glass or the finest Berkefeld and Selas filters. Serial transmission was accomplished, using bacteria-free filtrates. Poults given Seitz EK filtrates of infected material or unfiltered intestinal material from healthy turkeys remained normal.—M.G.G.

HINDS, V. G. (1956). **United Nations. Report to the Government of India on production of virus vaccines. FAO Expanded Technical Assistance Program. (August 1956).** pp. 13. [FAO Report No. 506.] Rome: Food and Agricultural Organisation of United Nations. 144

An account of the technique and a list of equipment required for the production of freeze-dried goat-adapted rinderpest vaccine, and freeze-dried Newcastle disease vaccine. Rinderpest vaccine prepared at the Bengal Veterinary College protected cattle when 1 ml. of a 1:24,000 dilution was injected; in practice 1 ml. of a 1:16,000 dilution was used (equivalent to 20 minimum rabbit-infecting doses).—R.M.

THOMAS, A. D. & MANSVELT, P. R. (1957). **The immunization of goats against heartwater.**—*J. S. Afr. vet. med. Ass.* **28**, 163-168. [Authors' summary and conclusions modified.] 145

The goat is highly susceptible to heartwater and in the Northern Transvaal bushveld losses from this disease are considerable. The natural resistance demonstrated in young calves is also present in young kids. It is probably not strong enough in the latter to achieve unaided as high a percentage of survival to artificial infection as in calves. I/v infection with the heartwater organism during this natural resistance phase, followed 10 days later by a single i/m dose of oxytetracycline, offers a practical and economical means of conferring immunity. Since the resistant phase extends at least to the age of 6 weeks, batches of kids can be accumulated for treatment up to that age. Field trials indicate that this method would work equally well in lambs.

LITWIN, J. (1957). **A simple method for cultivation of viruses and rickettsiae in the chorio-allantoic ectoderm of the chick embryo by inoculation via the air sac.**—*J. infect. Dis.* **101**, 100-108. [Author's summary modified.] 146

The chorio-allantoic ectoderm of chick embryos was infected with 4 viruses of the psittacosis-lymphogranuloma group, herpes simplex and vaccinia viruses, and *Rickettsia prowazeki*, by injecting the inoculum into the true airsac and then piercing the membrane with the needle. The method was studied in detail with feline pneumonitis virus. Infections were produced with a single yolk sac LD₅₀. With large inocula almost every surface cell of the membrane was infected and high virus titres were obtained within 30 hours. A simple method was developed for routine microscopic examination of the virus in whole, fixed and stained chorio-allantoic membranes.

IMMUNITY

MCKENNA, J. M. & STEVENS, K. M. (1957). **The early phase of the antibody response.**—*J. Immunol.* **78**, 311-317. [Authors' summary modified.] **147**

Spleen fragments from both primarily and secondarily injected rabbits produced antibody to protein antigens when cultured in a suitable medium. The longer the antigen remained *in vivo*, the higher were the antibody titres in extracts and in cultured material. The antibody was specifically neutralized by the homologous antigen. Antibody synthesis seemed to occur intracellularly with little or no induction phase, release into the surrounding medium occurring later. The titres of culture fluids and sera were about eightfold higher when *S. typhi* endotoxin was given 24 hours in advance of the primary antigen injection, but not when it was given simultaneously with the antigen. In both cases, spleens were removed 2 hours after antigen injection.

HALLIDAY, R. (1957). **The production of antibodies by young rats.**—*Proc. roy. Soc. Ser. B.* **147**, 140-144. [Author's summary modified.] **148**

Unweaned rats can produce specific agglutinins to *S. pullorum* during the period when normally γ -globulin is being absorbed from the milk. This process is as efficient in rats prevented from sucking their mothers as in normal litter-mates.

The titres of young rats passively immunized by sucking mothers hyperimmune to *S. pullorum* show a decline between 18 and 24 days of age parallel to the decline of more than

80% in the conc. of serum globulin which takes place during this period. Yet the titres of actively immunized young rats rise over the same period. These results suggest that the antibody produced by the active immunization is concentrated in the β -globulin, since this alone shows a definite rise during the period. It is known that the antibody in adult rats hyperimmunized with *S. pullorum* is concentrated in the γ -globulin. The results of the examination of electrophoretically separated protein fractions of the sera from actively immunized 24-day-old rats support this conclusion.

LARIN, N. M., GADDUM, R. & ORBELL, W. G. (1957). **The complement activity of canine serum.**—*J. Hyg., Camb.* **55**, 402-413. [Abst. from authors' summary.] **149**

Quantitative studies have shown that the haemolytic activity of canine complement was in all essentials similar to g. pig complement. Canine serum which had been heated at 56°C. enhanced the haemolytic activity of canine complement. The complement-enhancing power of heated canine serum was found to be increased with the concentration of serum up to 20%. Further conc. up to 50% serum dilution, or the use of undiluted serum, resulted in a reduction of this effect.

The present work shows also that canine complement can be used instead of g. pig complement for testing canine sera with virus antigen by the complement-fixation reaction, an advantage of this being that the use of canine complement permits the testing of canine sera which are anti-complementary to g. pig complement.

See also absts. 2 (antigenic structure of *Staph. pyogenes*); 12 (isoniazid and B.C.G. vaccination); 17 (maternal transfer via colostrum in swine erysipelas); 32-33 (*S. gallinarum* infection); 35 (preparation of vaccines); 36-42 (brucellosis); 43-44 (leptospirosis); 45-46 (entero-toxaemia); 52 (vibriosis); 58-61 (bovine contagious pleuropneumonia); 68 (*Trypanosoma vivax* antibodies in normal cotton rat serum); 75 (resistance of calves to *Eimeria bovis*); 84-87 (F. & M. disease); 88 & 90 (rabies); 92 (mouse pox); 102-104 (equine infectious anaemia); 109-111 (rinderpest); 114 (bovine rhinotracheitis); 115 (bovine epizootic fever); 118-119 (swine fever); 126 (immunological types of vesicular exanthema virus); 129 (atomized avianized distemper vaccine); 131 (canine virus hepatitis); 136 & 139 (Newcastle disease); 144 (production of virus vaccines in India); 145 (heartwater); 163 (*Haemonchus contortus*); 173 (*Toxocara canis*); 256 (typhoid vaccine and myelopoiesis in dogs).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

ERMACHENKOV, N. N. (1957). **[Hypoderma bovis infestation in horses.]**—*Veterinariya, Moscow* **34**, No. 5. pp. 40-41. [In Russian.] **150**

H. bovis infestation was observed in 8 out of 12 horses grazing in company with cattle. The affected horses were 2-4 years old and in poor condition. Older, well-fed horses were unaffected. Although smaller than normal, the larvae emerged spontaneously in order to pupate.

It is recommended that control measures for *H. bovis* should include the examination of horses.
—M.G.G.

CHAMBARD, P., TAPERNOUX, A., GASTELLU, C. & MAGAT, A. (1957). **Traitement externe et précoce de l'hypodermose bovine. [Early external treatment of warble fly larvae in cattle.]**—*Bull. Ass. franç. Chim. Cuir.* **19**, 168-181. **151**

Further trials on 116 cattle of a 1% emulsion of "Bayer L 13/59" confirmed its efficacy in killing warble fly larvae before they penetrated the skin of the host. [See also *V.B.* 27, 802 & 2720.]—R.M.

- I. ROTH, A. R. & EDDY, G. W. (1957). Tests with Dow ET-57 against cattle grubs in Oregon.—*J. econ. Ent.* 50, 244-246. 152
- II. MCGREGOR, W. S. & BUSHLAND, R. C. (1957). Tests with Dow ET-57 against two species of cattle grubs.—*Ibid.* 246-249. 153
- III. RADELEFF, R. D. & WOODARD, G. T. (1957). Toxicological studies of Dow ET-57 in cattle and sheep.—*Ibid.* 249-251. [Authors' summaries modified.] 154

I. During 1955 and 1956 Dow ET-57 was tested as a systemic insecticide against *Hypoderma lineatum* and *H. bovis* at doses of 10 to 200 mg./kg. It killed grubs in the backs of cattle and prevented the encystment of new ones. Second-instar were killed more rapidly than third-instar grubs. It did not kill many of the grubs that were within 2 weeks of emergence. In limited spray tests it killed all grubs at 2.5% concentration but not more than 50% at 1% concentration.

II. ET-57 was toxic to *Callitroga hominivorax* and *Stomoxys calcitrans* when given orally or subcutaneously to g. pigs at 100 mg./kg. It was less effective at 50 mg./kg. and ineffective at 25 mg./kg. When administered orally at 100 mg./kg. to 5 calves presumably infested with *Hypoderma lineatum* it appeared to be effective, as only 4 larvae appeared which died in the second instar. In a comparable group of 5 calves treated with ET-15, 98 larvae developed. ET-57 administered orally at 100 mg./kg. to 35 calves naturally infested with *H. bovis* and *H. lineatum* killed practically all larvae and prevented the encystment of new ones. Further research is required before ET-57 can be used for practical control.

III. ET-57 was given orally to 254 cattle. Mild symptoms of poisoning were observed at 125 mg./kg., and progressively more severe

symptoms as the dose was increased to 400 mg./kg. A sheep had mild diarrhoea at 400 mg./kg. At first the symptoms were similar to those produced by chlorinated phenols; then by organic phosphorus insecticides. There was muscular weakness, incoordination, prostration, and diarrhoea, occasionally salivation and dyspnoea, together with severe loss of weight at the higher doses. The cholinesterase content of the blood fell progressively over a period of 6 to 8 days. It rose again at the rate of about 1% daily. No animal died. There is evidently a wide range between the minimum toxic and minimum lethal doses.

- HUNTER, G. W., JR., PHILIPS, F. M., GRIFFO, J. V., JR. & WILLIAMS, J. S. (1957). Plot tests of potential acaricides at Camp Bullis, Texas, in 1954.—*J. econ. Ent.* 50, 262-263. [Authors' conclusion modified.] 155

Dieldrin dust at $\frac{1}{2}$ or 1 lb. per acre, or the spray at $\frac{1}{2}$ lb. per acre, or endrin spray at 1 lb. per acre almost completely eliminated *Amblyomma americanum* in 48 hours. This effect was maintained for at least 4 weeks. It is suggested that in a hot, dry environment at least a temporary reduction in the lone star tick population will result if either dieldrin or endrin is used at $\frac{1}{2}$ and 1 lb. per acre, respectively.

- KOUTZ, F. R. (1957). *Demodex folliculorum* studies. VI. The internal phase of canine demodectic mange.—*J. Amer. vet. med. Ass.* 131, 45-48. [Author's summary modified.] 156

Demodex mites were found in the body lymph nodes of 2 out of 10 dogs. In one, mites were found in the tongue muscles and lymph nodes but not in the skin. In a dog which died from the disease, the mites, present in all the body tissues, were especially numerous in the blood, lymph nodes, liver, spleen, kidneys, faeces, and urine. In only one of several attempts to infect dogs by direct transmission was there any evidence of success and this was of a transitory nature. The role of the mites in the internal organs is not known.

See also absts. 65 (role of tabanid flies in surra); 98 (tick-borne equine encephalomyelitis); 313 (book, cattle diseases).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

- THAPAR, G. S. (1956). Systematic survey of helminth parasites of domesticated animals in India.—*Indian J. vet. Sci.* 26, 211-271. 157

T. reported results of a survey mainly in slaughter-houses in northern and north-eastern States of India. The more noteworthy findings, partly reported earlier, were:— a new genus,

Olveria (Thapar & Sinha, 1945), with the amphistome *O. indica* as the type species, occurring in the rumen of cattle and buffaloes, and other species, *O. bosi* (Tandon, 1945), in buffaloes; *Paramphistomum gotoi* in buffaloes—hitherto reported only from the Far East; the extremely rare occurrence of *Fasciola hepatica* as compared

to the commonly encountered *F. gigantica*; and the presence in cattle of the trematodes *Gastrodiscus aegyptiacus* and *Pseudodiscus collinsi*, both hitherto believed to be confined to equines.

—R. N. MOHAN.

UL'YANOV, P. V. (1957). [Meteorological factors in the epidemiology of fascioliasis.] — *Veterinariya, Moscow* 34, No. 5, p. 42. [In Russian.] 158

Analysis of data for the past 10 years revealed that the spread of fascioliasis in sheep depends not only on the rainfall, but also on the air temp. during the spring and summer. These two factors affect the multiplication of the intermediate hosts, which were found chiefly in small pools with a dissolved oxygen content of 3.2 to 27.9 mg./litre and a pH of 6.5 to 7.4. The minimum density of about 4 per sq. metre in the spring rose to 115 per sq. m. in midsummer. *Fasciola* ova developed in 10 days in water with a temp. of 22° to 23°C. and an oxygen content of 25–28 mg./l.; when the oxygen content was only 7–8 mg./l. development took 13–14 days.

—M.G.G.

LÄMMLER, G. (1956). Die Chemotherapie der Fasciolose. II. Über vergleichende experimentell-chemotherapeutische Untersuchungen an der Leberegelerkrankung des Kaninchens. [Chemotherapy of fascioliasis. II. Experimental research in rabbits.] — *Z. Tropenmed. u. Parasit.* 7, 289–311. [English summary.] 159

L. tested various chemotherapeutic substances in rabbits, infested with *F. hepatica* and considered orally administered hexachlorethane the anthelmintic of choice. Carbon tetrachloride had a higher chemotherapeutic index but was more toxic for the host. Emetine hydrochloride was ineffective.—E.G.

BOKO, F. (1956). Prilog poznavanju kardijalne hidatidoze kod goveda. [Echinococcus in the heart in cattle.] — *Veterinaria, Sarajevo* 5, 205–212. [In Croat.] 160

Echinococcus was found in the heart in 6 of 16,000 cattle examined at Sarajevo abattoir.

—R.M.

YAMASHITA, J., OHBAYASHI, M. & KONNO, S. (1957). Studies on echinococcosis. V. Experimental infection of the sheep.—*Jap. J. vet. Res.* 5, 43–50. [In English. Authors' conclusion modified.] 161

In sheep the hydatid vesicle grows slowly, reaction of the surrounding connective tissue is noticeable, and the vesicle is polymorphic owing to herniation. Characteristic changes are the

appearance of lymphocytes and a necrotic layer. It is emphasized that development and reaction differ according to the host species.

RIEK, R. F. & KEITH, R. K. (1957). Studies on anthelmintics for cattle. I. The efficiency of toluene with special reference to the hookworm *Bunostomum phlebotomum* (Railliet 1900). II. The efficiency of 1:8 dihydroxyanthraquinone.—*Aust. vet. J.* 33, 162–168 & 169–173. [Authors' summaries modified.] 162

I. Toluene at a dose rate of 10 ml. per 100 lb. body wt. has been found to be effective in cattle against *B. phlebotomum*, *Haemonchus placei*, and *Cooperia* spp., and probably against *Ostertagia ostertagi* and *Trichostrongylus axei*. It has no effect on *Oesophagostomum radiatum*. Its efficiency depends on starvation overnight and it must be preceded by sodium bicarbonate to ensure closure of the oesophageal groove, and direct passage of the drug into the abomasum. The drug must be administered as an emulsion or suspension, as it has little efficiency, except against *H. placei*, when given mixed with liquid paraffin. The emulsion is more convenient to prepare and to use. In therapeutic doses toluene is relatively non-toxic and causes, at most, temporary anaesthetic effects, and some inappetence. No abnormalities in the concentration of r.b.c., or in w.b.c. counts have been noted after its use, nor have any changes been observed in the liver.

II. 1:8 Dihydroxyanthraquinone had high efficiency against *H. placei*, *Cooperia* spp. and *Oes. radiatum* but was ineffective against their immature stages and against *B. phlebotomum* and *Moniezia* spp. The numbers of calves with significant infestations of *O. ostertagi* and *T. axei* were too low for definite conclusions to be drawn, but *O. ostertagi* may also be susceptible to its anthelmintic action. Doses of 2 g. and 2.5 g. per 100 lb. body wt. appeared to be non-toxic but 4 g. to 5 g. per 100 lb. body wt. were accompanied by severe purging and inappetence for about 48 hours. As these calves could not be slaughtered it was impossible to determine whether they suffered any renal or hepatic damage, as was observed by Gordon [*V.B.* 27, 2440] in sheep. However, there was no clinical evidence of it and the growth rates were normal. As the drug was effective when administered directly into the rumen, premedication with sodium bicarbonate is not necessary. Although previous starvation is not required, the ingestion of milk, or protein supplements immediately before treatment appeared to reduce its efficacy considerably.

LUISENKO, A. A. (1956). [Immunity of sheep to *Haemonchus* infestation.]—*Trud. novocherkassk. zoo.-vet. Inst.* 9, pp. 139-158. [In Russian.] 163

Transient infestation resulted in a firm acquired immunity. Immunization and superinfection of lambs and particularly adult sheep resulted in a high immunity to infection with large numbers of infective larvae, lethal for non-immune controls. Such immunity lasted for 6-8 months; if maintained by periodic administration of larvae, absolute immunity could be maintained for 3 or more years. Formolized vaccine prepared from the helminths did not confer absolute immunity on sheep and goats, but relative immunity developed, and sheep resisted infection with 1,000 larvae 17 days after vaccination. The intraperitoneal administration of 500-50,000 live larvae provided relative, not absolute, immunity. Hyperimmune serum, even in large doses, did not protect lambs from infection with lethal numbers of larvae, but it prolonged their survival. Treated lambs infected with small numbers of larvae (up to 2,000) had only a mild infestation.—R.M.

HAMBURGER, R. (1956). Das Vorkommen parasitischer Würmer bei Kaninchen und deren pathogene Wirkung mit besonderer Berücksichtigung von *Trichostrongylus*. [Occurrence and pathogenicity of helminths in rabbits with special reference to *trichostrongyles*.]—*Inaug. Diss., Munich* pp. 38. 164

A survey of the helminths and coccidia of 426 domestic rabbits. *Trichostrongylus retortaeformis* was the commonest helminth (20.9% of rabbits were infested).—R.M.

SPEDDING, C. R. W. & BROWN, T. H. (1957). A study of subclinical worm infestation in sheep. II. The 'tolerance' level of infestation. III. The effect on wool production.—*J. agric. Sci.* 49, 223-228 & 229-233. [Authors' summaries modified.] 165

I. Over a period of 9 months 20 worm-free lambs gained 67.7% more weight than 20 infected lambs, but weight gains did not appear to be related to the degree of infestation. It was concluded that a marked depression of productivity may be associated with an egg count as low as 114 eggs per g. in sheep 4-7 months old.

II. Worm-free sheep produced 12-38.8% higher total fleece weights and 17.2-43.2% more clean, dry wool per unit area than infected sheep. None of the infestations was higher than occurs naturally, but the greatest effects were associated with a low level of nutrition. It is

suggested that the effect of worm infestation on wool production depends on the age of the host when first infected, the degree of infestation and the rate of wool growth at the time when the infestation is at its maximum.

SPEDDING, C. R. W. & MICHEL, J. F. (1957). The study of the transmission of the cattle lungworm (*Dictyocaulus viviparus*) in relation to pasture conditions.—*Parasitology* 47, 153-159. [Authors' summary slightly modified.] 166

The transmission of cattle lungworm infection was investigated in relation to four different pasture conditions—long grass, short grass produced by gangmowing, grazing by sheep and grazing by resistant cattle. The methods of study of value in this type of field investigation are discussed. It is suggested that the results can be usefully expressed as a series of coefficients which summarize the factors involved in the process of transmission. The methods of calculation of these coefficients are described.

ENIGK, K. (1957). Erfahrungen mit Aerosolbehandlung beim Lungenwurmbefall des Rindes. [Treatment of lungworms in cattle with aerosols.]—*Z. Tropenmed. u. Parasit.* 8, 54-59. 167

Of 5,670 cattle with parasitic bronchitis, 78% recovered or showed clinical improvement after a single treatment with an aerosol containing "ascariadol." [See also *V.B.* 24, 154 & 26, 1325.]—R.M.

UMOV, A. A. (1957). [Use of dītrazin in *Dictyocaulus* infestation of sheep.]—*Veterinariya, Moscow* 34, No. 5, p. 41. [In Russian.] 168

Dictyocaulus infestation in 176 sheep was greatly reduced by s/c injection, in the elbow region, of a soln. of diethylcarbazine citrate. The dosage was 0.1 g./kg. body wt. and was given in 2 injections 24 hours apart.—M.G.G.

SECHERBAKOV, E. V. (1957). [Treatment of *Muellerius* infestation of sheep and goats with intratracheal sodium salicylate solution.]—*Veterinariya, Moscow* 34, No. 5, p. 41. [In Russian.] 169

Sheep and goats were given 5% sodium salicylate soln. by intratracheal injection into both lungs, with an interval of 24 hours between injections. The dosages were 10 ml. for animals aged 2-6 months, 15 ml. for animals aged 6-12 months, and 20 ml. for older animals. Recently, animals have been treated by the subcutaneous route with 2-4 g. of sodium salicylate. Altogether 15,000 sheep have been treated with satisfactory results.—M.G.G.

DUNN, D. R. & WHITE, E. G. (1957). **Studies on the pig lungworm (*Metastrongylus* spp.). III. Experimental infection of guinea pigs.**—*Brit. vet. J.* **113**, 308-315. [Authors' summary modified.] **170**

G. pigs were fed infective larvae of *M. apri* in the form of infected earthworms (*Eisenia foetida*). Lungworm larvae or adults were found in 60 of the 126 animals. Respiratory symptoms or lung lesions suggested that at least a further 32 animals became infected but had expelled the worms when killed. The symptoms and the gross and microscopic lesions are described. Differential leucocyte counts in 51 animals revealed an eosinophilia in 39, and a basophilia in 45. In six g. pigs mature *M. apri* containing eggs with embryonated larvae were found. Feeding these eggs to earthworms, and then dosing g. pigs with the infective material, produced infection in 3 of 4 animals, but lungworms were found only in one, and none of these contained embryonated eggs. The pathogenesis of the infection in the g. pig is discussed and compared with the natural disease in swine.

GARKAVI, B. L. (1957). [Treatment of ascarid infestation in pigs with cadmium oxide.]—*Veterinariya, Moscow* **34**, No. 5. p. 41. [In Russian.] **171**

Over a period of 3 days, 10 pigs infested with ascarids, and weighing about 10 kg., each received 0.5 g. of cadmium oxide in the food, and 118 infested pigs, weighing 15-18 kg., each received 0.75 g. The treatment was claimed to remove 96% of the ascarids.—M.G.G.

EHRENFORD, F. A. (1957). **Canine ascariasis as a potential source of visceral larva migrans.**—*Amer. J. trop. Med. Hyg.* **6**, 166-170. [Author's summary modified.] **172**

There was a high incidence of infestation

with *Toxocara canis* in dogs aged 3-6 months in the mid-western U.S.A. In adults infestation was commoner in males than in females. Seasonal incidence of infestation was fairly uniform in bitches, but was highest during winter in males.

SADUN, E. H., NORMAN, L. & ALLAIN, D. (1957). **Detection of antibodies to infections with the nematode, *Toxocara canis*, a causative agent of visceral larva migrans.**—*Amer. J. trop. Med. Hyg.* **6**, 562-568. **173**

Experiments in rabbits indicated that the flocculation test with a purified antigen could detect antibodies at a relatively early date after infection with *T. canis*, and reactivity persisted for several months after infection. More work was required before the test could be considered as suitable for the diagnosis of disease due to migrating larvae in human beings.—R.M.

WALLNER, J. (1956). Über die Widerstandsfähigkeit von Wurmeiern und -larven der wichtigsten Haustierparasiten in Futtersilos. [Survival in silage of eggs and larvae of helminths of domestic animals.]—*Inaug. Diss., Munich* pp. 34. **174**

Eggs of *F. hepatica* were dead after 30 days in silage which had attained 30° to 40°C. Eggs of *T. pisiformis* and larvae of *D. filaria* were dead after 4 months; no examinations were made before this time. Eggs of *A. lumbricoides* did not survive 30 days in silage at 40°C. or more, but some survived for 4 months in silage at lower temperatures.—R.M.

ANON. (1957). **Worms in sheep, goats and cattle.**—*Fmg S. Afr.* **33**, 33-40. **175**

A popular account of the life-cycles, symptomatology, treatment and control of the various helminth parasites of domesticated ruminants in S. Africa.—H. SCOTT McTAGGART.

See also abst. 313 (book, cattle diseases).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

MARKS, S., GEORGE, L. A. & BUSTAD, L. K. (1957). **Fibrosarcoma involving the thyroid gland of a sheep given I¹³¹ daily.**—*Cancer, Philad.* **10**, 587-591. [Authors' summary modified.] **176**

An account of a metastasizing fibrosarcoma involving the thyroid gland of a sheep exposed continuously to 5 microcuries of I¹³¹ daily for a period of 4½ years.

SALERNO, G. (1956). Contributo alla conoscenza dei tumori del testicolo del cane. [Neoplasms of the testicle in the dog.]—*Ann. Fac. Med. vet. Pisa* **9**, 1-40. **177**

The histological characteristics of neoplasia of the testicle in 13 dogs are described. The types of neoplasms in order of frequency were Sertoli-cell, germinal and interstitial tumours. The right testicle was affected in 2 cases and

the left in 5, while in the remaining 6 both were involved. The age of the dogs was 5-7 years in 3 cases and 9-17 years in the others. Different types of tumour occurred simultaneously in individual cases and in 2 subjects there was atrophy of the contralateral testicle.—T.E.G.R.

TEREKHOV, P. F. (1956). [Sarcoma of the vulva and vagina in dogs.] — *Trud. mosk. vet. Akad.* 10, pp. 47-58. [In Russian.] 178

T. stated that 12-16% of all tumours in dogs were sarcoma of the vagina and vulva. The highest incidence was in dogs aged 2-6 years. The predilection sites were those with greatest vascularity: ventral wall of vulva and around the urethral orifice. Of 40 bitches with tumours in this region, 31 had sarcoma, 5 fibrosarcoma, 1 myxosarcoma and 3 fibroma. A method of surgical removal was described. No metastases or recurrences were found in bitches up to 5 years after operation.—S. TERLECKI.

AJELLO, P. (1956). Primi risultati di colture in "tubi rotanti" del tumore di Sticker. [Roller tube culture of Sticker's tumour.]—*Arch. Vet. Ital.* 7, 411-418. [English, French, German and Spanish summaries.] 179

In a study of the development of Sticker's tumour in roller tube cultures it was observed that a capsule of fibroblasts forms at the periphery of the explant. Solid masses of cells accumulate here and the constituent cells then develop, through various stages, into the characteristic parenchymatous elements of the tumour. This is considered to support the theory that the tumour tissue is derived from the stroma.

—T.E.G.R.

HOLZWORTH, J. & MEIER, H. (1957). Reticulum cell myeloma in a cat.—*Cornell Vet.* 47, 302-316. 180

A detailed illustrated account is given of the clinical and P.M. findings in a 7-year-old castrated male Persian cat affected with reticulum-cell myeloma involving blood, bone marrow, liver, spleen and lymph nodes. The symptoms were of wasting, lethargy, inappetence, low sp.gr. of urine, persistent fever, thirst, anaemia and mild jaundice. In the leucopenic blood were present primitive cells, and there was massive rouleaux formation and fibrin precipitation. No Bence-Jones protein was present in the urine and there was no pitting of flat bones in X-rays. Serum electrophoresis showed a widening of the gamma-globulin band and a lessened albumin band.—E. COTCHIN.

MELCZER, N. & KISS, J. (1957). Electrical method for detection of early cancerous

growth of the skin.—*Nature, Lond.* 179, 1177-1179. 181

When a direct current is passed through living tissue, a polarization counter-current is generated, which diminishes the effective d.c. voltage. Not being a true ohmic resistance, this is called a pseudo-resistance. The pseudo-resistance of normal skin is high, and a large decrease of pseudo-resistance has been found to be produced by malignant epidermal growths. A method of measuring the decrease is described, and results in human cases are recorded. The method might be used for the early detection of malignant growths of the skin.—E. COTCHIN.

HOLMAN, R. A. (1957). A method of destroying a malignant rat tumour *in vivo*.—*Nature, Lond.* 179, 1033. 182

On the assumption that agents which inactivate catalase or produce H_2O_2 (or free radicals) would have a detrimental effect on tumours, rats implanted with Walker adenocarcinoma 256, and maintained on a normal diet, were treated by replacing their drinking water with dilute solutions (optimum 0.45% by weight) of hydrogen peroxide. The rate of cure averaged 50-60%, the tumours usually disappearing in 15-60 days. So far, 72 rats have been cured, and are under observation on tap water and normal diets. The treatment was used on 4 human patients with advanced inoperable tumours: in 2, there was marked clinical improvement and a decrease in the size of the liver. Detailed experimental results are to be published shortly.—E. COTCHIN.

BURNET, MACF. (1957). Cancer—a biological approach. I. The processes of control. II. The significance of somatic mutation. III. Viruses associated with neoplastic conditions. IV. Practical applications.—*Brit. med. J.* April 6th, 779-786 & April 13th, 841-847. 183

Considering that "the failure in cancer is not due to any weakness of the organism but to a change in the character of the cells rendering them in one way or another insusceptible to the normal control" exercised by the body as a whole, B. first considers three main types of control in detail: (a) hormonal control of cell growth and functional activity of certain organs; (b) local controls of a physical nature, or due to mutual interaction of cell surfaces; (c) "immunological control" associated with "self markers" of the body. The possible implications of these in carcinogenesis are discussed. After an extended discussion of the significance of somatic mutation in relation to carcinogenesis, B. next considers proliferative lesions produced

by virus infection, and it is suggested that the virus produces what is equivalent to a somatic mutation. The practical applications of the view that somatic mutation is the basis of malignant disease are discussed in relation to prevention, diagnosis and cure. The work should be read in the original by those interested in modern views of carcinogenesis.

—E. COTCHIN.

SKIPPER, H. E., HEIDELBERGER, C. & WELCH, A. D. (1957). **Some biochemical problems of cancer chemotherapy.**—*Nature, Lond.* **179**, 1159-1162. **184**

Five panels of experts have been appointed to advise the "Cancer Chemotherapy National Center" in Bethesda, Maryland. This article has been prepared by one of these panels—that of pharmacology and biochemistry—to indicate what sort of biochemical problems related to cancer chemotherapy might be most usefully investigated. They suggest studies of: the nature of the metabolic differences between normal and malignant cells; the differences between drug-resistant and drug-susceptible neoplastic cells; the physiological and biochemical mode of action of anti-tumour agents (including hormones); drug potentiation and selective reduction of drug toxicity. An understanding of the biochemistry of metastasis and tissue invasion, and of carcinogenesis itself, may lead to a better understanding of the control or cure of cancer.—E. COTCHIN.

ISHITANI, R. & HORIUCHI, T. (1956). **Studies on the avian leucosis complex. II. A newly obtained transmissible strain of avian erythro-leucosis.**—*Bull. nat. Inst. Anim. Hlth.* No. 31, pp. 72-83. [In English, Japanese summary p. 71.] **185**

An account of transmission experiments in fowls.—R.M.

BURMESTER, B. R. & WATERS, N. F. (1956).

Variation in the presence of the virus of visceral lymphomatosis in the eggs of the same hens.—*Poult. Sci.* **35**, 939-944. **186**

Infectivity tests were carried out on eggs laid by a group of apparently healthy hens during a period of 2 years and on eggs laid during a period of 1½ years by progeny of the same hens. A preparation of pooled livers from 15-day embryos of each hen under test was inoculated into susceptible birds. In the case of the parent hens infectivity was high at 12, 15 and 18 months; at 2 and 3 years it was low or insignificant. In the case of the progeny infectivity was high up to 9 months, after which it decreased.—T.E.G.R.

BURMESTER, B. R. (1956). **The shedding of the virus of visceral lymphomatosis in the saliva and feces of individual normal and lymphomatous chickens.**—*Poult. Sci.* **35**, 1089-1099. **187**

By inoculating groups of day-old chicks with saliva and faeces from 5 naturally infected hens it was demonstrated that all the infected hens excreted virus in the saliva and two of them also excreted it in the faeces. The virus was demonstrated in the saliva and faeces of 2 of 5 apparently healthy laying hens; in the saliva of chicks hatched from eggs of infected hens; and from egg shells and debris in the hatchery. Day-old chicks were experimentally infected by inoculation and by contact. In the former case the virus was present in the saliva at 10, 30, 90 and 180 days of age; in the latter, at 90 and 180 days. These results are taken to indicate that the virus appears in the saliva early in infection which may remain latent for long periods or even for ever.—T.E.G.R.

NUTRITIONAL AND METABOLIC DISORDERS

WARNER, R. G., FLATT, W. P. & LOOSLI, J. K. (1956). **Dietary factors influencing the development of the ruminant stomach.**—*J. agric. Ed Chem.* **4**, 788-792. **188**

Thirty-four bull calves were fed diets consisting largely of milk, grain, or hay, or a mixture of hay and grain. They were slaughtered at intervals up to 16 weeks of age. In the calves fed on milk the forestomachs showed little change, and grew only in proportion to the increase in body weight. In all the other calves there were increases in the volume and tissue deposition of the forestomachs, and also in

the development of ruminal papillae. The changes were noticeable at 4 weeks of age. It is considered that the development of forestomach tissue is induced by metabolic products of bacteria rather than by coarse materials in the food. No papillary development was observed in a calf fed on milk, which was killed 70 days after it had been given 1½ lb. of nylon bristles.—M.G.G.

WHITE, R. R., CHRISTIAN, K. R. & WILLIAMS, V. J. (1956). **Blood chemistry and haematology in sheep on decreasing levels of food**

intake followed by starvation.—*N.Z. J. Sci. Tech.* **38**, 440-448. **189**

Twelve mature Romney wethers were individually penned for 128 days and fed grass of uniform composition on a decreasing daily intake from 1000 g. to 300 g. at varying intervals, and reduced to zero intake for the final 9 days. At daily intakes in excess of 500 g. no marked changes were observed in blood samples examined at weekly intervals. Lowering of intakes below 500 g. caused little or no change in blood non-protein nitrogen, amino-acid nitrogen, blood sugar, total keto-acid or serum calcium levels. At starvation levels, however, there were major changes in blood total acetone bodies, inorganic phosphorus and serum magnesium. The results are discussed in relation to metabolic changes.

—D. S. PAPWORTH.

BOURNE, G. H. (1957). Some aspects of the feeding of dogs and other carnivora.—*Proc. Nutr. Soc.* **16**, 93-98. [Author's summary modified.] **190**

The nutrients most likely to be short in the diets of domesticated or laboratory-fed dogs, and this applies to other carnivora in captivity, are vitamins A and D, various members of the vitamin B complex, calcium and possibly iron. It is essential therefore that certain supplements be added to the diet: these should be cod-liver oil and either liver or dried brewer's yeast. Of the last two, dried yeast is by far the cheaper.

SCOTT, P. P. (1957). Problems encountered in studying the nutrition of the cat.—*Proc. Nutr. Soc.* **16**, 77-82. [Author's summary copied *verbatim*.] **191**

Lack of specific data on growth rate and reproductive efficiency, together with limited information concerning nutritional requirements has hindered the development of satisfactory stock diets for cats. High-protein diets are essential for growth and reproduction, and some information is available on the requirements for members of the B-vitamin complex for growth. Endemic disease may be troublesome in attempts to carry out nutritional investigations on cats. Because of its convenient size, its great importance in physiological and pharmacological research, and the interesting metabolic differences it has shown from the rat, the cat merits further consideration as a laboratory animal.

LANE-PETTER, W. (1957). Modern ways of feeding laboratory animals.—*Proc. Nutr. Soc.* **16**, 59-62. [Author's summary copied *verbatim*.] **192**

The modern habit of feeding cubed or pelleted compound diets, with or without supple-

ments, is convenient but has certain disadvantages, which may be inherent in the system. The impression of standardization in named diets is unreliable, nor can it be assumed that the composition of a compound diet is equal to the sum of the compositions of its ingredients. Further advance in the feeding of laboratory animals should pay more attention to the biological needs of the animal; this may mean including at least a proportion of unprocessed food, such as cereal grains, in the diet.

BRUSH, M. K., MCCOY, J. R., ROSENTHAL, H. L., STAUBER, L. A. & ALLISON, J. B. (1957). The addition of non-ionic surface-active agents of the polyoxyethylene type to the diet of the hamster, the mouse and the dog.—*J. Nutr.* **62**, 601-619. [Abst. from authors' summary.] **193**

The addition of "Myrj 45", "Myrj 52" or "Tween 60" at varying concentrations to the diet of hamsters, mice or dogs did not alter growth or food efficiency. "Myrj 45" did not cause diarrhoea or any other abnormalities in any of the animals. Diets containing 5% of "Myrj 52" or "Tween 60" did cause diarrhoea in hamsters. Higher concentrations of these surface-active agents up to 10 and 20% were necessary to produce diarrhoea in mice or dogs. Increase in the incidence of kidney casts and of chronic interstitial nephritis occurred in hamsters fed 5% or more "Myrj 52" or "Tween 60" in "Fox Chow". No histopathological changes specific for "Myrj 45", "Myrj 52" or "Tween 60" were observed in mice.

HILL, C. H., KEELING, A. D. & KELLY, J. W. (1957). Studies on the effect of antibiotics on the intestinal weights of chicks.—*J. Nutr.* **62**, 255-267. [Authors' summary modified.] **194**

The results indicate that the small intestine is more sensitive to antibiotics than is the body as a whole as reflected by body weight because (1) the small intestine decreased in wt. before an increase was noted in body wt., and (2) lower levels of the antibiotic which did not increase body wt. caused a decrease in intestinal wt. High levels of penicillin completely counteracted the body growth retardation and relative intestinal wt. stimulation caused by feeding unheated soya bean meal as 10% of the total diet, but did not completely counteract these effects when the soya bean meal was increased to 30 or 40%. The inclusion of fibrous materials, lucerne and wheat bran, as 10% of the total diet did not significantly affect the response of the small intestine or body wt. to penicillin. It is sug-

gested that these findings may cast some doubt on the possibility of a causal relationship between the effect of antibiotics on the small intestine and the growth response usually observed when antibiotics are fed.

COULSON, C. B. (1957). **Properties of lucerne and other saponins.**—*Biochem. J.* **67**, No. 1. pp. 10P-11P of Proceedings. **195**

Lucerne yielded 0.6% dry wt. of crude water-soluble saponin, while white clover yielded 0.04% of poorly soluble non-haemolytic saponin. A comparison of the lucerne saponins with quillaja saponins showed that although their haemolytic activity and foaming properties were similar, the lucerne saponins were much less active on smooth muscle.—R.M.

BRUNE, H. (1956). Experimentelle Untersuchungen über die Wirkung oraler Saponingaben beim Wiederkäuer. [**Experimental study of the action of orally administered saponin in ruminants.**]—*Z. Tierernähr.* **11**, pp. 267-289. [Abst. from abst. in *Nutr. Abstr. Rev.* **27**, p. 608 (1957).] **196**

B. studied the effect on mineral metabolism, digestibility of nutrients and general health of from 1 to 8 g. saponin administered daily by mouth to sheep. A dosage of 5 g. or more daily for 10 days was lethal. The pathology of saponin poisoning was described.—R.M.

KOLB, E. (1956). Untersuchungen über "wahre Glukose", Gesamtreduktion und Restreduktion im Blut und Plasma von Haustieren. (Pferde, Schweine, Rinder, Kälber, Schafe, Hunde, Geflügel). [**Studies of "true glucose", total reduction and residual reduction in blood and plasma of domesticated animals.**]—*Arch. exp. VetMed.* **10**, 859-873. **197**

The usual methods for glucose determine the total amount of reducing substances in the blood or plasma, which comprises true glucose and residual reducing substances (mainly glutathione). K. used several methods to determine each of these components in horses, cattle, calves, sheep, pigs, dogs, fowls and ducks. The results are tabulated.—R.M.

KATZ, L. N., STAMLER, J. & PICK, R. (1956). **Nutrition and atherosclerosis.**—*Fed. Proc.* **15**, 885-893. **198**

Epidemiological, clinical, pathological and experimental data are taken to indicate that nutritional imbalance leading to altered cholesterol-lipid-lipoprotein metabolism plays a decisive, though not exclusive, role in the causation of atherosclerosis. The influence of neutral fat, undernutrition and other types of dietary

imbalance, lipotropic factors, sterols and brain extract, is briefly outlined. From observations on chickens, dogs, rabbits and human beings it is concluded that the condition is reversible and regression of the lesions occurs when the diet is corrected.—T.E.G.R.

GEISER, K. J. (1955). Über die Anwendbarkeit des Sulkowitch-Testes zur Prüfung des Serum-Calcium-Gehaltes beim Rinde. [**Suitability of the Sulkowitch test on urine for determining the calcium content of bovine serum.**]—*Inaug. Diss., Hanover* pp. 40. **199**

The amount of calcium in the urine, as determined by the Sulkowitch test, did not parallel the calcium content of the blood, determined photometrically; the test was unreliable for determining hypocalcaemia in cattle.—R.M.

CRAWFORD, J. D., GRIBETZ, D., DINER, W. C., HURST, P. & CASTLEMAN, B. (1957). **The influence of vitamin D on parathyroid activity and the metabolism of calcium and citrate during calcium deprivation.**—*Endocrinology* **61**, 59-71. [Authors' summary modified.] **200**

Rats fed a calcium-free diet supplemented with 10,000 i.u. of vitamin D daily developed after about 20 days a severe convulsive disorder suggestive of tetany. Much milder tetany of later onset was observed in rats deprived of Ca and deficient in vitamin D. In the animals given the vitamin no parathyroid hypertrophy was observed, chemical studies showed almost normal serum concentrations of total and ionized calcium, and tissue analyses indicated the accumulation of citrate in the muscle, bone and kidney but not in the brain. There was diffuse, osteoporotic decalcification of the bone. Rats not given vitamin D had parathyroid hypertrophy, lower concentrations of total and ionized calcium in the serum and rachitic bone lesions with decalcification most marked at the epiphyses. The experiments failed to explain the so-called paradoxical action of the vitamin in rickets or in babies fed cow's milk. It is suggested that, with heavy doses of vitamin D, tetany may result from accumulations of citrate in or about the peripheral nervous tissue.

WASSERMAN, R. H., COMAR, C. L., SCHOOLEY, J. C. & LENGEMANN, F. W. (1957). **Inter-related effects of L-lysine and other dietary factors on the gastro-intestinal absorption of calcium 45 in the rat and chick.**—*J. Nutr.* **62**, 367-376. [Authors' summary modified.] **201**

Singly administered L-lysine and vitamin D promoted Ca⁴⁵ absorption in vitamin D-deficient rats. The combined effect of L-lysine and vita-

min D was about the sum of the effects of the individual components. L-lysine and lactose singly increased Ca^{45} absorption in normal rats, and their combined effect was also additive.

L-Lysine, L-arginine, and skim milk powder did not increase Ca^{45} absorption in rachitic chicks. Treatment of rachitic chicks with vitamin D resulted in nearly complete absorption of Ca^{45} . For this reason, the combined effect of other substances with vitamin D could not be evaluated.

Proportionally more of the absorbed Ca^{45} was found in the femurs in vitamin D-supplemented than in vitamin D-deficient rats. Vitamin D had no apparent effect on the deposition of absorbed Ca^{45} in the tibias of rachitic chicks.

SWAN, J. B. & JAMIESON, N. D. (1956). **Studies on metabolic disorders in dairy cows. III. The effect of after-calving underfeeding and of thyroprotein dosing on the level of serum magnesium in dairy cows.**—*N.Z. J. Sci. Tech.* Sect. A, **38**, 363-382. 202

Clinical grass staggers was produced experimentally in dairy cows after calving when fed on a reduced diet with or without thyroprotein. A drop in serum magnesium was observed when the animals were fed thyroprotein alone or in conjunction with underfeeding, given a sudden change in quality, or quantity of feed, immediately after calving, during oestrus, or when there was a reduction in grazing or ruminating time. It is suggested that the experimental conditions produced hypomagnesaemia by causing either singly or together a negative energy balance, or digestive disturbances.

—D. S. PAPWORTH.

GLICK, D., FREIER, E. F. & OCHS, M. J. (1957). **Studies in histochemistry. XLVII. Microdetermination of magnesium and its histological distribution in the adrenal in various functional states.**—*J. biol. Chem.* **226**, 77-82. [Authors' summary copied *verbatim*.] 203

Details are given of a photometric micro-procedure, based on modifications of the Titan yellow method, for the determination of magnesium in microgram samples of tissue. By analysis of microtome sections of adrenal tissue, the quantitative distribution of magnesium in the histological zones of the adrenals of the guinea pig and rat was measured. It was found that the administration of ACTH to rats was without demonstrable influence. Furthermore, no change in the magnesium concentration in any region of the rat adrenal was observed as a consequence of hypophysectomy a month earlier.

HARTMAN, R. H. (1956). **A study of the mode of action of manganese in the utilization of iron by rabbits and lambs.**—*Dissertation, N. Carolina St. Coll.* pp. 152. [Abst. from abst. in *Diss. Abstr.* **17**, 713. (1957).] 204

A study of the interaction between manganese and iron was divided into three parts. Part I dealt with the effect of excessive manganese upon haemoglobin formation in rabbits. Part II consisted of 5 trials (two animals a trial) in which a single dose of radioiron was fed and 4 trials in which the dose of radioiron was injected into rabbits. Part III consisted of two trials on lambs using either oral or intravenous doses of radioiron. In each part two diets were fed, one a control and the other a manganese diet containing 2000 p.p.m. of supplemental manganese.

Manganese supplementation (1) retarded haemoglobin regeneration in anaemic rabbits; (2) hindered the absorption of radioiron as revealed by whole blood and haemin time curves, by the radioiron lost in faeces and in ingesta and by the concentration of radioiron in the livers; (3) did not affect either the rate of removal of radioiron from the blood or the rate of haemoglobin synthesis as observed from the whole blood, haemin and plasma time curves, and (4) increased losses of radioiron from the body in two rabbit injection trials and one lamb injection trial and in the same trials decreased the liver concentration of radioiron. [See also *V.B.* **26**, 2039.]

BLAXTER, K. L., SHARMAN, G. A. M. & MACDONALD, A. M. (1957). **Iron-deficiency anaemia in calves.**—*Brit. J. Nutr.* **11**, 234-246. [Authors' summary modified.] 205

Iron-deficiency anaemia was produced in 4 calves, with 2 calves as controls. The anaemia was microcytic and normochromic and was associated with poikilocytosis and a normoblastic reaction of the bone marrow. Clinically, the anaemic calves showed poor gains of weight, an inability to withstand circulatory strain, atrophy of the papillas of the tongue and loss of appetite. The anaemia responded to Fe administration in the one calf to which treatment was given.

A field experiment involving 15 farms and 92 unweaned beef calves showed that daily dosage with 35 mg. of Fe as the succinate resulted in a significant increase in the haemoglobin content of the blood and an increase in the mean cell volume. On different farms there exist different Hb contents in the blood of calves, and calves with low Hb concentrations usually have smaller mean cell volumes. This 'physiological anaemia' is of the same type as Fe-deficiency anaemia. A supplement of 20 mg. Fe daily is not sufficient

for a calf aged 1-4 months receiving milk as the sole diet, and it is suggested that the requirement is nearer 100 mg. daily. The daily iron intake in milk is usually 2-4 mg.

KÖHLER, H. (1957). Blutbild und Knochenmark des Ferkels. III. Mitteilung: Zur Ätiologie der Anaemie. [Bone marrow and the blood picture in the piglet. III. Aetiology of piglet anaemia.]—*Zbl. VetMed.* 4, 459-484. [English, French and Spanish summaries. English summary modified.] [For parts I and II, see *V.B.* 26, 3588; 27, 206.] 206

Attempts were made to produce experimentally in piglets an anaemia comparable with the one observed naturally. It was found possible to produce an anaemia with the same haematology and histology and similar changes in serum proteins. In extensive experimental studies the following substances, used either singly or in combination, had no significant effect on either the spontaneous or the experimental anaemia of piglets:—folic acid (intramuscularly or orally), vitamin B₁₂ (intramuscularly or orally), iron (orally as "C-ferro" or intramuscularly as "Coferman"), cobalt ("Coferman" or "Cobaltin-forte"), vitamin C, cod-liver oil, "Campolon," aureomycin, yeast, meat meal, and methionine.

After having determined the profound changes found in the bone marrow in this anaemia (hyperplasia, sclerosis and finally atrophy) by histological methods and also the qualitative rather than quantitative lesions occurring in the bone marrow (inhibition of maturation) the author attaches special importance to effective prophylaxis. The conditions leading to piglet anaemia could be entirely prevented by feeding the sow a mixture of meat meal (100 g. daily), vitamin B₁₂ (10 µg.), folic acid (10 mg.) and iron (22 mg. Fe gluconate) for about 50 days before and 50 days after parturition. Protein deficiency played a most important role in the genesis of piglet anaemia, and iron deficiency only a subsidiary role. Protein deficiency was not, however, the only factor.

STURKIE, P. D. (1956). The effects of excess zinc on water consumption in chickens. — *Poult. Sci.* 35, 1123-1124. 207

Water soluble zinc sulphate was added to the drinking water (2,230 p.p.m. of pure zinc) of 6 laying hens. There was a decrease in water consumption, egg production and body wt. throughout the experiment. These effects disappeared when the administration of zinc was discontinued.—T.E.G.R.

ERSHOFF, B. H., HERNANDEZ, H. J. & MUCKENTHALER, J. M. (1957). Potentiating effects of materials of plant and animal origin on symptoms of hypervitaminosis A in the rat.—*J. Nutr.* 62, 527-538. [Authors' summary modified.] 208

Immature rats were fed a purified ration containing a massive but relatively non-toxic dose of vitamin A. Supplements of lucerne meal and other succulent plants resulted in a significant potentiation of the symptoms of hypervitaminosis. Both the dried lucerne juice and the water-washed pulp were active in this respect. Desiccated liver, yeast, "Vigofac" (a product derived from fermentation sources) and aureomycin hydrochloride also showed activity. In contrast to the above, supplements of all the known nutrients had little if any potentiating effect.

SCHUMACHER, H. H. & SCHINDLER, R. (1957). Zur Morphologie der E-Avitaminose. [Morphology of vitamin E deficiency.]—*Zbl. allg. Path. path. Anat.* 96, 563-571. 209

The authors described the symptoms and pathology of muscular dystrophy in 5 kangaroos, kept in captivity.—R.M.

HUTT, F. B. (1957). On genetic differences in resistance of fowls to encephalomalacia. — *Brit. vet. J.* 113, 399-401. 210

That chickens of the heavy breeds are more susceptible than Leghorns to nutritional encephalomalacia has already been demonstrated [Howes & Hutt, 1952, (*V.B.* 23, 506); Carnaghan & Markson, 1956, (*V.B.* 26, 3227)]. The author suggests selective breeding to raise the average level of resistance to the disease.

—L. M. MARKSON.

BLAIZOT, J. & ANDRAL, A. M. (1956). Sur quelques propriétés de la pyrithiamine, anti-vitamine B₁. [Properties of pyrithiamine, anti-B vitamin.]—*C. R. Soc. Biol., Paris* 150, 1759-1764. 211

Experiments with isolated rat intestine suggest that pyrithiamine does not compete with vitamin B₁ as far as acetylcholine metabolism is concerned. Although animals given pyrithiamine show neuromuscular disturbances which can be controlled by thiamine or co-carboxylase administration; these disturbances may result from a non-specific toxic polyneuritis.

—J. A. NICHOLSON.

VAN REEN, R. & STOLZENBACH, F. E. (1957). Pyridine derivatives as growth factors in the

duckling. — *J. biol. Chem.* **226**, 373-380.
[Abst. from authors' summary.] **212**

Ducklings fed a niacin-deficient diet rapidly developed deficiency symptoms and grew poorly. There was a marked response to nicotinamide and pyridyl-3-aldehyde mixed in the diet but not to pyridyl-3-carbinal or β -picoline. The last two compounds showed a positive response, however, when given by mouth. All of the above compounds, diphosphopyridine nucleotide (DPN), or nicotinic acid produced positive responses when administered intraperitoneally.

TIECKEN, G. W. (1956). Een onderzoek over de schildklierfunctie bij de hond. [Function of the thyroid gland of the dog.] — *Thesis, Utrecht* pp. 58. **213**

Thyroid function was assessed by the use of radioactive iodine. Subnormal function was often associated with eczematous skin disease, but these cases seldom responded to treatment with thyroid gland extract, particularly when nephritis was also present. Determination of cholesterol in the blood was not of great diagnostic value for assessing thyroid function, but it was useful for studying the effect of thyroid therapy.—R.M.

LOGOTHETOPOULOS, J. & SCOTT, R. F. (1956). Histology and function of the developing foetal thyroid in normal and goitrous guinea-pigs.—*J. Endocrin.* **14**, 217-227. **214**

The thyroid glands of 30-day-old foetal guinea-pigs from dams treated with propylthiouracil were of the same weight and histological appearance as the glands of control foetuses. But increased thyroid weight, loss of colloid and increased follicle cell height were noted in 36-day-old foetuses from treated dams. Goitre developed to a greater extent in the foetuses than in the dams. The ratios of thyroid/plasma inorganic ^{131}I in goitrous foetuses and dams were similar to those in controls. The incorporation of ^{131}I by normal foetuses at 60 days was higher than in the dams. The young of treated dams had true colloid goitres at the ages of 4 and 8 months.—M.G.G.

OWEN, E. C. & DARROCH, R. A. (1957). The effect of thyrotropin on milk yield and heart rate of the goat.—*J. Dairy Res.* **24**, 157-161.
[Author's summary modified.] **215**

The effect of thyrotrophin on milk yield and heart rate in goats was compared with that of growth hormone (somatotrophin). The milk yields of the two goats which received growth hormone were increased appreciably. Thyrotro-

phin increased the heart rate in two goats, in one of which a large increase in milk yield was also produced.

ALBRIGHT, J. L. & BLOSSER, T. H. (1957). Blood levels and urinary excretion of calcium in normal cows and cows with parturient paresis after intravenous injections with calcium borogluconate.—*J. Dairy Sci.* **40**, 477-486. **216**

As a result of tests in 14 cows with milk fever, 5 normally calving mature cows and 3 normally calving heifers, with slow i/v injections of either a 32.7% or a 25.5% calcium borogluconate solution, the authors found that, except for the first 4 hours, there was little difference in serum Ca levels between any of the cows receiving the two different strengths of solution. They therefore concluded that there is no advantage in treating cows with milk fever with the highly concentrated solution and also showed that the injection of such a solution 12 hours after calving does not prevent milk fever and may even precipitate attacks.

—G. P. MARSHALL.

SCARISBRICK, R. & PUGH, P. D. S. (1957). The passage of acetate across the placenta and its uptake by the foetal sheep.—*Brit. vet. J.* **113**, 328-341. [Authors' summary modified.] **217**

The uptake of acetate by the foetus was investigated in 9 ewes at the end of pregnancy by direct determination, under anaesthesia, of arterio-venous differences in the umbilical cord. Foetal blood leaving the placenta contained more acetate than blood returning to the placenta. The concentration of acetate in the foetal circulation was only about one fifth of that in the maternal circulation. This seems to limit the utilization of acetate by the foetus, which is tentatively estimated as equivalent to 10% of the oxygen uptake. The concentration gradient across the placenta associated with unit molecular rate of passage of acetate was much higher than for oxygen and lower than for sodium ion. This is discussed. Similar data on the concentrations of ketone bodies were obtained in these ewes and in 4 ewes with clinical ketosis. The concentration in the foetal circulation was one third to one fifth of that in the maternal circulation, and utilization was very small.

ADLER, H. J. (1957). Some aspects of bovine ketosis.—*Thesis, Cornell* pp. 146. **218**

A laboratory and clinical study of bovine ketosis. Under chemical diagnostic techniques, the author covers the subjects of selection of blood sources for the determination of glycaemic

levels, the relationship between reactions to the Ross tests and the degree of ketonaemia, and a method for direct estimation of acetone content of blood samples. Under clinical studies are included a discussion of pushing in cattle with encephalopathies, studies on a dairy herd fed silage of the butyric acid type, and 27 clinical cases of ketosis. The author presents a lengthy theoretical discussion of the problem. Studies on silage cover an evaluation of the method used for determining the total ketone-body content of silage and a preliminary survey of the content of acetone and its immediate precursors in silage. The appendix covers 28 case reports.

—H. L. GILMAN.

SONODA, M., SAKAMOTO, T., YAMAGUCHI, M., NAKAMURA, R., KIMURA, S. & KANEKO, I. (1956). **Clinical and biochemical studies on the basis of ketone bodies in cattle. I. Blood ketone bodies in normal dairy cattle.**—*Jap. J. vet. Res.* 4, 147-160. [In English.] 219

368 healthy cows were studied over two years with respect to blood and urine ketone bodies. In addition the correlation of ketone body levels and blood sugar levels with the numbers of eosinophile leucocytes was examined. The blood ketone levels varied widely and it was only possible to make a broad classification into normal and subnormal groups. It was noted that such factors as parturition, milk yield,

season, and feeding arrangements exerted an influence on the rise or fall of total ketones. The subnormal group showed an increased blood sugar level and marked decrease in the number of eosinophile leucocytes.—D. S. PAPWORTH.

MAYES, P. A. & ROBSON, W. (1957). **The determination of ketone bodies.**—*Biochem. J.* 67, 11-15. [Abst. from authors' summary.] 220

A method is described for the accurate quantitative analysis of ketone bodies from small samples (0.1 ml.) of blood and urine. The method is based on the conversion of all ketone bodies into acetone, on the reaction of acetone with 2:4-dinitrophenylhydrazine and on subsequent colorimetric determination of acetone-2:4-dinitrophenylhydrazone in carbon tetrachloride.

CARDASSIS, J. (1956). [Treatment of ketosis with potassium permanganate.] — *Delt. Hellen. kten. Hetair.* No. 23. pp. 132-138. [In Greek. French summary.] 221

This treatment is aimed at eliminating ketone bodies already present and preventing the formation of new ones. It consists in the oral administration of 500-650 ml. of a 1:1000 aqueous soln. of potassium permanganate thrice daily for 5-6 days. A marked improvement is noticeable after 24 hours: the animal regains its appetite, lactation steadily return to normal, and acetonaemia and acetonuria gradually diminish.

—T.E.G.R.

See also absts. 251 (effect of breed and nutrition on dentition in cattle); 315 (book, swine nutrition).

DISEASES, GENERAL

ANON. (1956). **United Nations. Food and Agriculture Organization. Report of the second Near East meeting on animal health, held in Damascus, Syria, 5-10 March, 1956.**—*Meet. Rep. Agric. Div. Food & Agric. Org.* of the United Nations. No. 1956/8. pp. 49. 222

The meeting, attended by delegates from Near-East countries, discussed the training of veterinarians, vaccine production, and disease problems (including rinderpest, Newcastle disease, pox diseases, brucellosis, salmonellosis and chronic respiratory disease of fowls.)—R.M.

ANON. (1956). **Laboratory Animals Bureau. Collected papers. Vol. 4. Report of a Symposium on infections in laboratory animals held at the Royal Veterinary College, London on 13th April, 1956.** pp. 68. London: Laboratory Animals Bureau M.R.C. Laboratories. 7s. 6d. 223

This contains the following papers, read at the Symposium: Epidemiology and laboratory

mice (A. A. Tuffery); Control of ectromelia in mouse colonies (M. H. Salaman); Control of infection in lab. cats and dogs (W. L. Weipers); Infections in lab. monkeys (A. P. Goffe); Control of disease in rabbits (J. S. Paterson); Control of disease in lab. poultry (R. F. Gordon) and Salmonella in lab. animals (J. Taylor and J. D. Atkinson).—R.M.

WARSTAT, V. (1956). **Die Papierelektrophorese als Differential- und Verlaufsdiagnosticum bei der Toxoplasmose und der nervösen Staupe. [Differential diagnosis and prognosis of toxoplasmosis and nervous distemper by paper electrophoresis.]**—*Inaug. Diss., Munich* pp. 35. 224

57 sera from 31 dogs (8 with clinically diagnosed toxoplasmosis and 24 with distemper) were examined. Certain electrophoretic patterns were considered to be diagnostic for each disease; hyperalbuminaemia implied bad prognosis.

—R.M.

PERLASCA, M. (1956). Variazioni proteiche nel siero di suino rilevate nel periodo dell'ingrasso ed in varie condizioni patologiche. [**Variations in the serum proteins of healthy and of diseased pigs.**]—*Profilassi* **29**, 142-146. [English and French summaries.] **225**

Protein levels in normal pigs were subject to wide variations due to various causes. Fasting and fatigue caused a drop in albumin levels—less evident in uncastrated animals. A decrease in albumins, and an increase in globulins was observed in tuberculous pigs; in acute inflammatory conditions (pericarditis, mastitis, pneumonia) there was a drop in albumins and an increase in α -globulins; in subacute or chronic inflammatory conditions or during recovery from disease an increase in γ -globulins was observed. After extreme fatigue there was a significant diminution in the γ -globulin levels of pigs which at P.M. examination showed no lesions except a pale liver.—T.E.G.R.

AUSTVOLL, J. (1956). The prophylaxis and treatment of gut edema using 5% sulfamethazine, 5% sulfamerazine solution.—*Vet. Med.* **51**, 507-511. **226**

Good results are claimed for the prophylaxis and early treatment of oedema disease of pigs by i/p injection of the combined sulphonamides.—T.E.G.R.

TARAZONA VILAS, J. M. (1956). Observaciones sobre la enteritis hemorrágica porcina. [**Haemorrhagic enteritis in pigs.**]—*Cienc. vet.* **18**, 224-228. **227**

A widespread rapidly diffusing outbreak affecting animals of all ages (but more serious in young ones) occurred in the summer of 1955. It was characterized by subnormal temperature, anorexia and haemorrhagic diarrhoea. Hyperacute cases were observed in which death supervened before the onset of symptoms. P.M. lesions were localized in the caecum and colon. It is considered that vitamin A deficiency is a predisposing factor and may aggravate and prolong the disease. Good results were obtained with streptomycin and phthalyl sulphathiazole.—T.E.G.R.

SCHAFER, J. D. (1957). Ethopropazine in the control of chorea of dogs.—*Vet. Med.* **52**, 243-244. **228**

Ethopropazine ("Parsidol"), in a dosage of 100 mg. thrice daily for the average-sized animal, was used in 25 dogs which developed chorea in the course of distemper or related diseases. The drug provided control of the involuntary movements in "selected cases" (no

numbers stated), proved superior to mephensin in this respect, and caused no side effects.—G. P. MARSHALL.

AJMERITO, G. C. (1957). La terapia parenterale prednisolonica nell'eczema del cane. [**Prednisolone in the treatment of eczema in the dog.**]—*Atti Soc. ital. Sci. vet., Perugia* **1956** **10**, 669-672. [English and French summaries.] **229**

In 20 dogs with various types of dermatitis and eczema, B. tested the value of prednisolone, given either i/d as multiple injections of a 1% solution, of the freeze-dried hemisuccinate, at the rate of 5 mg. daily, or s/c or i/m as the acetate in a daily dosage of 2.5-10 mg., according to body weight, for 10-20 days. Results were said to have proved better than those achieved by the oral route and there were no undesirable local or systemic reactions, particularly as regards water and mineral metabolism.—G. P. MARSHALL.

ŽEŠKOV, B. & MARŽAN, B. (1957). Kronični osteomielitis mladih njemačkih ovčara (eozinofilni panostitis mladih pasa). [**Chronic osteomyelitis in young dogs.**]—*Vet. Arhiv.* **27**, 129-133. [In Croat. English and German summaries.] **230**

Chronic osteomyelitis of the long bones in 14 Alsatian dogs 4-12 months old was described. The condition resembled that described by Gratzl, and by Baumann & Pommer [*V.B.* **22**, 1100-1101]. Bacteriological examination of affected bones failed to reveal an infective agent. The animals recovered spontaneously.—E.G.

SOVA, Z. (1956). Další poznatky o zánětu žvýkačích a spánkových svalu u psů s výraznou krevní eosinofilií. [**Eosinophilic myositis in dogs.**]—*Sborn. čes. Akad. zemědělsk. Věd, vet. Med.* **29**, 339-352. [In Czech. English, German and Russian summaries.] **231**

An account of clinical and haematological studies of eosinophilic myositis in the masseter and temporal muscles of five Alsatian dogs. The aetiology of the condition was not ascertained.—E.G.

DERRICK, E. H. & ST. GEORGE-GRAMBAUER, B. M. (1957). Megacolon in mice.—*J. Path. Bact.* **73**, 569-571. [Authors' summary copied verbatim.] **232**

Megacolon was found to be a common cause of morbidity in a large colony of laboratory mice. Histological study in some cases has shown a

resemblance to Hirschsprung's disease in that myenteric ganglion cells are absent from the undilated distal segment of the bowel.

HELBACKA, N. V. L. (1956). **Studies on blood and meat spots in the hen's egg.**—*Dissertation, Univ. Minnesota* pp. 71. [Abst. from abst. in *Diss. Abstr.* 17, 714-715. (1957).] 233

Coloured meat spots fluoresced red when exposed to ultra-violet light. This property made their differentiation from blood more accurate because blood does not emit any fluorescence. On P.M. examination fluorescent meat spots were found in the uterus and other areas of the oviduct. This red fluorescent material was extracted by chemical means and identified as a porphyrin, the same pigment that is responsible for the colour in brown shelled eggs.

Feeding a coccidiostat (Nicarbazin) reduced shell colour, meat spot colour, and the fluorescence of the meat spots simultaneously. It was suggested that the shell pigment was responsible for the colour of the meat spots.

Blood or haemoglobin derivatives (*i.e.*, haemin) were not a normal constituent of meat spots. Histological studies indicated that meat spots are amorphous, with no r.b.c. or other cellular elements present.

Some meat spots contained large amounts of calcium, but that was not localized to any specific areas of the spots. X-ray opaque material was extremely variable in the spots. It was concluded that blood and meat spots are separate entities.

MORITA, S. & NISHIDA, S. (1956). **Hematological and histological changes induced by adrenocorticotrophic hormone and formalde-**

hyde stressor in the domestic fowl.—*Endocrinologia japon.* 3, 39-49. 234

Heterophilia and lymphopenia occurred when A.C.T.H. was injected i/v or i/p, but not when it was injected i/m or s/c. Stress effects were observed in fowls after blood was drawn from the combs. The effects of i/m injection of 1 ml. of 4% formaldehyde were: decrease in weight of the thymus, spleen and bursa of Fabricius; hypertrophy of the adrenal gland; extension of cortical cells into the medulla of the thymus, appearance of reticular cells in the cortex and increase of Hassall's corpuscles and of PAS-positive intra-cellular granules; lymph follicle involution in the white pulp, diminution of r.b.c. and heterophilic infiltration of the red pulp of the spleen; cellular hyperplasia and hypertrophy, mitosis and decrease in chromaffin substance in the adrenal gland. In the bursa of Fabricius there were no striking changes other than involution of the follicles.—T.E.G.R.

HANSEN, H. -J. (1956). **Studies on the pathology of the lumbosacral disc in female cattle.**—*Acta orthopaed. scand.* 25, 161-182. [In English. French and German summaries.] In *Medd. Veterinärhögsk. Stockh.* 30, (1955/1956). 235

Following an account of some features of normal lumbar disks of cattle, age changes are described, dehydration being very noticeable. Degenerative changes, which, possibly as a result of mechanical factors, occur most commonly in the lumbo-sacral disk, are discussed. Bone adjacent to this disk is also sometimes affected, sclerosis, lysis, cyst-formation and avulsion all being seen. It is thought that most cases never show any objectively observable clinical symptoms.—R. N. SMITH.

POISONS AND POISONING

VOLCANI, R., BONDI, A., LEWIN, Y. & NEUMARK, C. (1956). [Maintenance of milk cows in a selenium affected area.]—*Refuah vet.* 13, In Hebrew: pp. 160-171. In English: p. 192. 235

Following the recurrence of selenium poisoning in a herd of cows, attempts were made to determine the value of nitrosol for its prevention, but the results were inconclusive. The forage plants used in the feeding experiments were found to vary greatly in their capacity for absorbing selenium; lucerne, rye-grass and clover having higher concentrations than green maize or beet. It is concluded that selenium poisoning could be avoided and cows maintained

in the district by clearing the most suitable fields for the cultivation of the two last-mentioned crops.—J. A. NICHOLSON.

ROSENFELD, I. & EPPSON, H. F. (1957). **Effect of choline deficiency on chronic selenium poisoning of rats.**—*Amer. J. vet. Res.* 18, 693-697. [Authors' summary modified.] 237

Rats given a diet deficient in choline and daily i/p injections of selenium grew less and had a higher mortality rate than rats on the same diet without Se. Rats injected with Se grew faster and lived longer when 0.2% choline chloride was added to the diet. Selenium had no effect on fat deposition in the liver. The

choline chloride did not prevent damage of the liver and kidney. The early pathological changes in the liver and kidney of the animals given Se were discussed.

KONNO, S., KUMAGAI, T. & ICHIMURA, K. (1956). [Haematological studies on panmyelopathia of cattle associated with poisoning by trichloroethylene-extracted soya bean meal.]—*Bull. nat. Inst. Anim. Hlth.* No. 31. pp. 115-134. [In Japanese. Abst. from English summary.] **238**

Poisoning affected 500 cattle in Hokkaido, and 40 of them died. Smears of peripheral blood and bone marrow revealed aplastic anaemia in severe cases and agranulocytosis in mild cases. —R.M.

LEE, H. J. (1957). The toxicity of *Phalaris tuberosa* to sheep and cattle and the preventive role of cobalt.—*Proc. VIIIth Int. Grassl. Congr., Palmerston North, 1956* pp. 387-395. Discussion: p. 396. [Author's summary modified.] **239**

An account of a disease known as phalaris staggers which, under certain circumstances, may affect sheep and cattle that are confined to pastures in which *Ph. tuberosa* predominates. Particular reference was made to: historical aspects; the circumstances under which the disease occurs; the probability that phalaris is potentially toxic throughout its growing season; the factors that influence the occurrence of the disease; the preventive role of cobalt; the practical control of the disease.

BROWN, P. H. (1956). Seneciosis or grass staggers of horses in Basutoland.—*Bull. epiz. Dis. Afr.* 4, 285. [French summary p. 322.] **240**

Senecio poisoning in horses may be acute or more usually chronic. In the acute form the only lesions are degeneration of the liver and haemorrhagic enteritis. In the chronic form, which has a very slow onset, there is loss of condition, stumbling gait and eventually emaciation and jaundice with cirrhosis of the liver. Molasses or sugars have a beneficial effect and appear to act as a preventive.

—J. A. NICHOLSON.

DOLLAHITE, J. W. & ANTHONY, W. V. (1957). Poisoning of cattle with *Gutierrezia microcephala*, a perennial broomweed.—*J. Amer. vet. med. Ass.* 130, 525-530. [Authors' summary modified.] **241**

In four years, 58 cows were fed broomweed over periods from 12 to 124 days to study its abortifacient properties. 29 of the cows aborted or delivered small weak calves, 35 had retained foetal membranes, and 5 cows died. Only 33 calves were reared.

RADELEFF, R. D., WOODARD, G. T., NICKERSON, W. J. & BUSHLAND, R. C. (1955). The acute toxicity of chlorinated hydrocarbon and organic phosphorus insecticides to livestock.—*Tech. Bull. U.S. Dep. Agric.* No. 1122. pp. 46. **242**

This is a summary of toxicity tests performed on farm livestock (including youngstock but excluding poultry) by the U.S. Department of Agriculture since 1947. Insecticides were applied to the skin and given by mouth. They were divided into two groups: chlorinated hydrocarbons (chlordan, B.H.C., toxaphene, D.D.T., strobane and others) and organic phosphorus compounds (parathion, malathion, E.P.N., diazinon and others). The general symptoms and pathology for each group are summarized. Data on toxic dosages of each insecticide for each species of animal are tabulated.—R.M.

ELY, R. E., MOORE, L. A., CARTER, R. H. & APP, B. A. (1957). Excretion of endrin in the milk of cows fed endrin-sprayed alfalfa and technical endrin.—*J. econ. Ent.* 50, 348-349. [Authors' summary modified.] **243**

Cows eating hay containing endrin residues of 1.9, 2.8, and 3.7 p.p.m. produced milk with up to 0.05, 0.14, and 0.15 p.p.m. of endrin, respectively. These results indicate that more than 20 mg. of endrin must be consumed daily for the excretion of measurable quantities in the milk. When the endrin was administered in soya bean oil, higher intakes were required for its detection in the milk. Toxic symptoms were noted in two cows receiving over 1.5 mg. of endrin in soya bean oil per kg. body wt., but relatively low concentrations of endrin were excreted in the milk fat.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease.)

ANDRÉ, T. (1956). Studies on the distribution of tritium-labelled dihydrostreptomycin and tetracycline in the body.—*Acta radiol.*

Stockh. Suppl. No. 142. pp. 89. [In English.] **244**

The author described the preparation of

tritium-labelled dihydrostreptomycin and tetracycline, and the results of autoradiographic studies of sections of the whole body and individual tissues and organs of mice, during 5 hours after i/v inj. of the labelled antibiotics. In mice with abscesses due to *C. pyogenes*, both antibiotics were traced in the contents of the abscesses. The only radioactivity in urine from treated mice was due to the antibiotics, which indicated that there was no appreciable breakdown of them during the first 5 hours. Distribution after local application and intrapleural injection was also studied.—R.M.

ELLISON, T. & TODD, A. C. (1957). The metabolism of phenothiazine, N. F., in dairy calves. I. Chronological distribution of drug in digestive tract contents. II. Chronological levels of drug in blood serum, bile, and urine. III. Chronological levels of drug in liver, kidney, spleen, and mesenteric lymph nodes. IV. Chronological total drug recovery.—*Amer. J. vet. Res.* **18**, 519-529. [Absts. from authors' summaries.] 245

I. No drug was detected in the digestive tract posterior to the proximal duodenum one hour after treatment. Phenothiazine was first detected in the faeces after 10 hours. 22 hours after treatment the ratio of phenothiazine to phenothiazone was nearly 1:1 in the jejunum, jejunum-ileum, ileum, and rectum, and 2:1 in the colon and caecum. The concentration of phenothiazine was greater in the omasum than in the rumen after 40 hours. After 80 hours no traces of phenothiazine were detected in the digestive tract, but phenothiazone was detected in the rumen, reticulum, omasum, abomasum, mixed jejunum-ileum, and colon.

II. The concentrations of phenothiazine and its derivatives in the blood serum of 18 calves fluctuated sharply with several peaks. The maximum concentrations were 61 mg. of phenothiazine/ml. and 115 mg. of phenothiazone/ml. 14 hours after treatment. Maximum concentrations in the bile were detected after 16 hours, and in the urine after 20 hours.

III. The drug first appeared in the liver as phenothiazone after 2 hours. Phenothiazine was detected after 3 hours. Maximum concentrations were after 16 hours for phenothiazone and after 24 hours for phenothiazine. Phenothiazine was first detected in the kidneys after 2 and phenothiazone after 3 hours, with maximum concentrations after 16 hours and 24 hours respectively. In the spleen, phenothiazone appeared after one hour and phenothiazine after 3 hours. Maximum concentrations of both substances occurred after 5 hours. In the

mesenteric lymph nodes, phenothiazine appeared after 8 and phenothiazone after 10 hours. Maximum concentrations occurred after 12 hours for phenothiazone and 14 hours for phenothiazine.

IV. Eighteen calves of mixed breeds and of both sexes were each dosed orally with 100 g. of phenothiazine, N.F. They were slaughtered from 1 to 120 hours later and the contents of the digestive tract, liver, spleen, kidneys and bile analysed for the total content of phenothiazine and phenothiazone. No drug was detected 120 hours after treatment.

GOLBERG, L., SMITH, J. P. & MARTIN, L. E. (1957). The effects of intensive and prolonged administration of iron parenterally in animals.—*Brit. J. exp. Path.* **38**, 297-311. [Abst. from survey of paper, p. ii.] 246

The authors administered very large doses of iron over long periods to rats and rabbits by parenteral injection of an iron-dextran compound. The distribution of the siderosis so produced is described and illustrated: tests were also carried out of the function of the organs affected. Haemochromatosis was not produced.

I. & II. DARLINGTON, F. G. & CHASSELS, J. B. (1956). A further study of the breeding and racing of Thoroughbred horses given large doses of alpha tocopherol. III. Breeding experiments in 1956. IV. Racing experiment in 1956.—*Summary. (Shute Inst. Clin. Lab. Med. Canad.)* **8**, 55-70 & 71-82. 247

I. Studies carried out during a second year of experiments [See also *V.B.* **27**, 531] indicate that alpha tocopherol improves the fertility of mares and stallions. Data on the administration of vitamin E to brood mares showed that, by regulation of dosage to fit individual requirements, 48 of 55 mares proved in foal. Data on 5 stallions at stud receiving vitamin E indicated an expected 71% of registered foals for the year, being 8% above their average for the preceding 5 years.

II. The study reported for a second year included racehorses previously studied as well as horses receiving alpha tocopherol for the first time. Using an increased dosage the vitamin E appeared satisfactory for improving the condition of horses and thus increased the consistency of performance with greater earnings. Nervous animals, usually difficult to manage and train, responded well to treatment. In general the stamina of treated horses was obviously improved. It is pointed out, however, that success in the use of alpha tocopherol depends

on the intelligence and care exercised in administration and the use of properly regulated dosage.—R. V. L. WALKER.

BURN, J. H., EPSTEIN, H. G., FEIGAN, G. A. & PATON, W. D. M. (1957). **Some pharmacological actions of fluothane.**—*Brit. med. J.* August 31st, 479-483. [Authors' summary modified.] **248**

Fluothane reduces cardiac output in the dog heart-lung preparation. It is about 70% as active as chloroform in this respect. It lowers the blood pressure, in the cat under chloralose, more than can be readily accounted for by ganglion block. It is equally active in the animal in which the splanchnic vascular bed is removed by evisceration.

Fluothane depresses the knee-jerk of the cat under chloralose in concentrations from 0.5% upwards. The intensity of this depression, together with its time course, corresponds sufficiently with that of the hypotensive action to suggest that the latter is produced by depression of central vasomotor mechanisms. The drug is not itself strongly ganglion-blocking, it potentiates ganglion block by hexamethonium and D-tubocurarine. Fluothane up to 4.5% does not

paralyse the neuro-muscular junction; but it antagonizes suxamethonium and potentiates D-tubocurarine.

CATELLANI, G. & CHELI, R. (1956). Azione dell'acido adenosintrifosforico (A.T.P.) sulla fosfatasi alcalina del callo di fratture sperimentali. [Action of adenosine triphosphoric acid on the alkaline phosphatase of the callus in bone fractures.]—*Acta med. vet., Napoli* **2**, 41-53. [English, French and German summaries.] **249**

In order to study the influence of A.T.P. on the repair of bone fractures, 8 rabbits were given 1 mg. A.T.P. per kg. body wt. daily after experimental fracture of the radius; 8 animals served as controls. The animals were killed one to four weeks later and a detailed histological examination was made of the healing fractures. The animals receiving A.T.P. showed a more rapid development of osteoid connective tissue and more rapid callus formation than the controls. It is suggested that A.T.P. acts beneficially by increasing the rate of calcium phosphate precipitation and also by activating phosphatase.—J. A. NICHOLSON.

See also absts. 3 (tetracycline in bovine mastitis); 12 (isoniazid and B.C.G. vaccination); 31 (nitrofurazone for *S. pullorum* carriers); 54 (aureomycin in porcine agalactia); 55 (resistance to antibodies of some bacteria); 66 (nitrofurazone in trypanosomiasis); 67 (stilbamidine); 71 (trichomoniasis); 76-79 (coccidiosis); 81 ("berenil" in piroplasmosis); 82 ("berenil" in theileriosis); 151-155, 242 & 243 (insecticides); 159, 162, 167-169 & 171 (anthelmintics); 184 (chemotherapy of cancer); 221 (potassium permanganate in ketosis); 226 (gut oedema); 228 (ethopropazine in chorea of dogs); 229 (prednisolone in canine eczema); 292 (vaginal prolapse).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

WALKER, C. A. (1957). **The skin thickness of cattle in Northern Rhodesia.**—*J. agric. Sci.* **49**, 211-213. [Author's conclusions modified.] **250**

The findings supported those of Dowling [see *V.B.* **26**, 992 & 993] in showing significant differences in skin thickness between temperate and tropical breeds of cattle, the latter having thinner skins. There was no significant difference within breeds between animals of various ages, but a low plane of nutrition appeared to yield a thinner skin. Tropical breeds had a significantly thinner papillary layer, and this was closely correlated with their higher heat toleration; whether this is a prime factor in heat toleration is not known, but in view of its histology it is considered unlikely. The Africander had skin characteristics intermediate between the temperate and the true tropical breeds.

JOUBERT, D. M. (1956). **On the effect of breed and nutritional plane on dentition in the cow.**—*Proc. Brit. Soc. Anim. Prod.*, 1956. pp. 111-116. **251**

In order to determine the date of eruption

of the permanent incisor teeth, 28 heifers of 4 different breeds were observed for 9 months. The heifers were grouped into pairs of paternal half-sisters of about the same age, one member of each pair being kept on a high nutritional plane and the other on a low plane. The mean ages of eruption for all heifers were 24.4, 30.7, 37.2 and 43.3 months respectively for the 1st, 2nd, 3rd, and 4th pairs. Distinct breed differences were noted, beef Shorthorns shedding their teeth earlier than Friesians and Jerseys. A low nutritional plane retarded eruption; the deciduous incisors also wore down more rapidly than the corresponding teeth of the animals on a high nutritional plane.—J. A. NICHOLSON.

KOLB, E. (1956). Untersuchungen über das Vorkommen von Monoamin- und Polyphenoloxydase im Serum von Geflügel, Rindern und Schweinen. [Occurrence of monoamine- and polyphenoloxydase in serum of fowls, cattle and pigs.]—*Arch. exp. VetMed.* **10**, 874-881. **252**

Oxidase activity against tyramine and butylamine was detected in serum from pigs, calves

and adult cattle. Pig serum contained more polyphenyloxydase than serum from man and other animals. The same enzyme was also present in serum from fowls and ducks, but no monoaminase, diaminoxidase or histaminase was demonstrated in these species.—R.M.

MEDWAY, W. & KARE, M. R. (1957). **Water metabolism of the domestic fowl from hatching to maturity.**—*Amer. J. Physiol.* **190**, 139-141. 253

The combined respiratory and cutaneous water loss was high on the first day of life, dropped to a minimum between 1 and 2 weeks of age and rose sharply from 2 to 4 weeks, attaining adult values. The basal metabolic rate and the total body water were also estimated.

—R.M.

ADAMS, E. W. (1957). **Histological and histochemical observations on bovine teat epithelium.**—*Thesis, Cornell* pp. 84. 254

This is a report of histological observations on the epithelium of the skin covering the external surface of the teat, the epithelium lining the streak canal, and the epithelium lining the teat sinus for a distance of about 8 mm. contiguous with the streak canal epithelium.

—H. L. GILMAN.

SALMON LEGAGNEUR, E. (1956). **La mesure de la production laitière chez la truie. [Measurement of milk production by the sow.]**—*Ann. Inst. nat. Rech. agron.* Ser. D. **5**, 95-110. 255

Milk production of 30 normal sows was estimated by weighing the piglets before and after feeds.—R.M.

PERRY, S., WEINSTEIN, I. M., CRADDOCK, C. G., JR. & LAWRENCE, J. S. (1957). **The combined use of typhoid vaccine and P^{32} labeling to assess myelopoiesis.**—*Blood* **12**, 549-558. [Interlingua summary. Authors' summary modified.] 256

I/v administration of killed *Salmonella typhi* to dogs produced severe leucopenia followed by marked leucocytosis. The myelopoietic response was similar to that following leucopheresis. Study of the incorporation of P^{32} by deoxyribonucleic acid in the leucocytes indicated that the bone marrow is the main reservoir for granulocytes contributing to peripheral blood leucocytosis. Leucocytes which left the vascular tree were unable to re-enter in significant numbers. The use of typhoid vaccine to stimulate leucocytosis and of P^{32} to measure the fate of cells released from the marrow is an accurate and simple experimental method of measuring certain aspects of myelopoiesis.

HAHN, K. (1956). **Das Inselorgan des Schweines unter Berücksichtigung von Alter und Konstitution. [Histology of the pancreas of the pig in relation to age and constitution.]**—*Inaug. Diss., Munich* pp. 51. 257

In pigs, the percentage of A cells in the islets of Langerhans decreased with increasing age, while the percentage of B cells increased. There were more A cells in the islets of unthrifty pigs aged 5-6 months, than in normal pigs of the same age. This change indicated a disturbance of carbohydrate metabolism similar to that occurring in diabetes mellitus in man.

—R.M.

BIGGS, P. M. & KING, A. S. (1957). **A new experimental approach to the problem of the air pathway within the avian lung.**—*J. Physiol.* **138**, 282-299. [Authors' summary modified.] 258

A new experimental approach to the still unsolved problems of the movement of air within the avian respiratory tract has been attempted, the principle being a quantitative comparison of tracheal breathing with breathing through one of the air sacs. This has been applied in the fowl to the interclavicular sac cannulated at the humerus. Air or oxygen was breathed.

Humeral breathing was found to be markedly inferior to tracheal, being characterized by reduction in oxygen consumption in spite of an increase in amplitude and minute volume.

A glass cylinder and a glass tube, representing respectively the dead space and the frictional resistance of the inter-clavicular sac, were applied to the trachea; they caused changes in amplitude, minute volume and oxygen consumption comparable to those observed in humeral breathing. But there was a more drastic reduction in oxygen consumption during humeral breathing than during tracheal breathing through the cylinder and tube, especially when air was breathed; also overt signs of asphyxia were more pronounced during humeral breathing.

This indicated that breathing through the humerus had disorganized the movement of air within the lung itself. It is tentatively concluded from this that the movement of air in the lung is more likely to be circulation, of the type proposed by Hazelhoff [*V.B.* **22**, 1164], than a simple oscillation or reciprocal movement as suggested by Scharnke (1938) and Zeuthen (1943).

KIVALO, E. & TALANTI, S. (1957). **The neurosecretory substance in the hypothalamic-hypophyseal system of the horse.**—*Acta*

endocr., Copenhagen 26, 128-134. [Abst. from authors' summary.] 259

The relation of neurosecretory material to the blood vessels in the hypothalamic nuclei, the infundibulum, the pars nervosa, and to the third ventricle was carefully studied but no intra-ventricular or intravascular secretory granules were found.

MEYER, H. (1957). **The corticocortical fiber systems of the dog's brain.**—*Thesis, Cornell* pp. 87. 260

This thesis covers a macroscopic, a microscopic and a developmental study of the fibre connections of the dog's brain which have their origins and terminations in the cerebral cortex. The different definitions of the association and commissural systems found in commonly used text-books are compared and discussed. Explanations of the different views, based on historical background, are attempted. There is a critical comparison of the nomenclature used by different authors for individual fibre tracts. The work of early neuromorphologists was studied and compared with publications of later authors. The structures of the corticocortical fibre systems of the adult dog's brain were dissected and described.

In applying the preparation technique described by Klingler to the developmental series of puppies' brains a new method of studying the central nervous system was developed. It proved to be especially suitable for hodological studies of early stages, where fibres were not yet myelinated.—H. L. GILMAN.

SCHALLER, O. (1956). Die periphere sensible Innervation der Haut am Rumpfe des Rindes. [**Peripheral sensory innervation of the skin of the trunk of the ox.**]—*Wien. tierärztl. Mschr.* 43, 346-368 & 534-561. [English, French and Italian summaries.] 261

As a result of an extensive study on cattle, S. plotted the course of the spinal nerves and their sensory fields. Particular attention was paid to areas of present-day clinical significance. —R. N. SMITH.

KITCHELL, R. L., STROMBERG, M. W. & DAVIS, L. H. (1956). **Comparative studies of the dorsal vagal motor nucleus in ruminants and non-ruminants.**—*Anat. Rec.* 124, 319. [Only abst. given. Abst. from abst.] 262

The nucleus is almost entirely concerned with innervation of thoracic and abdominal structures; cells supplying fibres to abdominal organs are generally located in the rostral part

of the nucleus and those supplying thoracic organs are located mainly in the caudal part of the nucleus.—R. N. SMITH.

STOREY, E. (1957). **Relaxation in the pubic symphysis of the mouse during pregnancy and after relaxin administration, with special reference to the behaviour of collagen.**—*J. Path. Bact.* 74, 147-162. [Abst. from author's summary.] 263

While the pubic symphysis of the mouse is relaxing during pregnancy, the fibroblasts in its symphyseal ligament produce granules positive to periodic acid-Schiff reagent (P.A.S.), collagen bundles swell and the fibrils stain more easily with P.A.S. and silver, and capillaries become more permeable to a high-molecular dye such as Evans blue. At the same time, collagen can be easily stretched and broken and the ligament becomes permanently elongated at low loads. Extensive remodelling of bone also takes place and the symphyseal cartilage is much altered.

Oestrogen administration produces slight swelling of the symphyseal ligament and its collagen, with extensive bone resorption. Relaxin given to the oestrogen-sensitized mouse reproduces the changes of pregnancy in the pubic symphysis. It also softens the cervix uteri through inducing collagen changes similar to those occurring in the symphysis. Relaxin exerts no *in-vitro* effect on the symphyseal connective tissue.

NAGLER, M. (1956). Untersuchungen über Struktur und Funktion des Schweineuterus. [**Structure and function of the uterus of the sow.**]—*Inaug. Diss., Munich* pp. 25. 264

N. studied the macroscopic and histological structure of the uterine musculature, and discussed its function.—R.M.

YADAVA, R. C. P. & CALHOUN, M. L. (1956). **Comparative histology of the kidney of domestic animals.**—*Anat. Rec.* 124, 384. 265

An abstract of an oral communication containing a small collection of isolated facts which the authors believed had not been previously described.—R. N. SMITH.

MAURIN, C. (1955). L'épiphyse des animaux domestiques. [**The pineal body in domestic animals.**]—*Thesis Paris, (Alfort)* pp. 80. 266

A description of the morphology of the pineal body of the ox is followed by comparative comments on those of the other domestic animals. A few remarks on the histology are included. —R. N. SMITH.

SEIFERLE, E. (1957). Zur makroskopischen Anatomie des Pferdegehirns. [**Macroscopic anatomy of the brain of the horse.**—*Acta anat.* 30, 775-786. 267

Particular attention was paid to the brain stem, the hippocampus and the fornix.—R.M.

SALE, E. E., PRIEST, S. G. & JENSEN, H. (1957). **Studies on the antiproteolytic activity of bovine blood.**—*J. biol. Chem.* 227, 83-89. [Authors' summary copied *verbatim*.] 268

The results of experiments designed to separate antitryptic and antiplasmin activities of bovine blood by ammonium sulfate fractionation, by electrophoresis, and by heat inactivation agree with the assumption that the antiproteolytic activity of bovine blood against trypsin and human plasmin is due to a single inhibitory factor.

BELL, D. J. (1957). Tissue components of the domestic fowl. 2. **Blood urea.**—*Biochem. J.* 67, 33-36. [Author's summary modified.] 269

Measured by urease in the Conway apparatus, the urea nitrogen content of healthy fowl blood averaged about 1.2 mg./100 ml., in reasonable agreement with some, but not all, previous investigations. Very high values which have been reported in the literature, *e.g.* 12-19 mg. of urea nitrogen/100 ml. of blood, may have arisen from technical failures. No elevation in blood urea was found in a number of birds with early glomerulonephritis.

BLACK, A. L., KLEIBER, M., BUTTERWORTH, E. M., BRUBACHER, G. B. & KANEKO, J. J. (1957). **The pentose cycle as a pathway for glucose metabolism in intact lactating dairy cows.**—*J. biol. Chem.* 227, 537-550. [Abst. from authors' summary.] 270

Glucose catabolism was studied with intact lactating dairy cows injected intravenously with glucose-1- C^{14} and glucose-6- C^{14} . The recovery of C^{14} was greater in the expired CO_2 after glucose-1- C^{14} but was smaller in alanine, and serine from casein, and glycerol from milk fat, than the corresponding results after glucose-6- C^{14} .

The C^{14} levels in alanine, serine, and glycerol were used to estimate the quantitative importance of the pentose cycle in glucose catabolism. The authors concluded that the pentose cycle probably has a major role in glucose metabolism in the lactating cow.

BLAIR, G. W. SCOTT & GLOVER, F. A. (1957). **Crystallization patterns of sodium chloride in**

bovine (uterine) cervical mucus as related to its consistency.—*Nature, Lond.* 179, 420. 271

The crystallization patterns of sodium chloride in bovine uterine samples of cervical mucus were compared on a graphical basis with the consistency of the mucus expressed as "P.L." numbers. ["P.L." stands for palm-leaf crystallization patterns. "P.L." numbers are grades of consistency based on these patterns.] Comparison of 200 such samples (comprising tests on non-pregnant animals and those between 17 and 30 days after conception) revealed a highly significant relationship. It was shown that "P.L." number cannot be directly related to the amount of sodium chloride, and the striking relationship with consistency of the mucus required further study.—D. S. PAPWORTH.

THIERSCH, J. B. (1957). **Effect of 2,4,6, triamino—"S"—triazine (TR), 2,4,6, "Tris" (ethyleneimino)—"S"—triazine (TEM) and N, N', N'—triethylenephosphoramidate (TEPA) on rat litter in utero.**—*Proc. Soc. exp. Biol.* 94, 36-40. 272

The effect of these three compounds was studied on groups of female rats to which they were fed on the 4th and 5th, 7th and 8th or 11th and 12th days of pregnancy. "TR" was harmless to the rat litters. "TEM" had its maximum effect at the time of implantation, but failed to destroy the entire litters. In rats treated with TEM the placenta was smaller than normal, and progesterone protected 40% of the foetuses against otherwise lethal doses of the chemical. "TEPA" destroyed all litters when given on the 7th and 8th, or 11th and 12th days of pregnancy. The types of malformation of different tissues caused by "TEM" and "TEPA" were recorded.—D. S. PAPWORTH.

THIERSCH, J. B. (1957). **Effect of 2-6 diaminopurine (2-6 DP) : 6 chlorpurine (CIP) and thioguanine (ThG) on rat litter in utero.**—*Proc. Soc. exp. Biol.* 94, 40-43. 273

2-6 Diaminopurine, 6 chlorpurine, and thioguanine were tested for their action on rat litters by administering them to pregnant females over six months old which had already had one previous satisfactory litter. The compounds were fed on the 4th and 5th, 7th and 8th or the 11th and 12th days of pregnancy. All three substances caused damage or malformation of the foetuses of varying degrees and this effect was discussed in relation to the period of administration.—D. S. PAPWORTH.

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

CLIFFORD, P. A. (1957). **Pesticide residues in fluid market milk.**—*Publ. Hlth Rep., Wash.* 72, 729-734. [Abst. from author's summary.] 274

Of 801 samples of market milk collected throughout the U.S.A. in the autumn of 1955, 62% contained residues of chlorinated organic parasitocides as indicated by the fly bioassay procedure. B.H.C., D.D.T., lindane, D.D.D. ("Rhothane"), methoxychlor, and D.D.E., were identified by paper chromatography, some samples containing up to 1.5 p.p.m. Results of such chemical tests as the Schechter-Haller colorimetric method should be treated with caution unless interferences are known to be absent. Organic phosphate parasiticide residues were not detected by an *in vitro* cholinesterase inhibition test.

I. KOLOBOLOTSKII, G. V. (1956). [Chemical nature and experimental basis of colour reactions in the demonstration of bacterial toxins in meat.]—*Trud. mosk. vet. Akad.* 17, pp. 22-32. [In Russian.] 275

II. KOLOBOLOTSKII, G. V. (1956). [The colour reaction for bacterial toxins with different oxidation-reduction indicators.]—*Ibid.* pp. 33-37. 276

III. KOLOBOLOTSKII, G. V. (1956). [Sanitary evaluation of meat on the results of the colour reaction for bacterial toxins.]—*Ibid.* pp. 38-43. 277

I—III. These papers report in greater detail work which has been previously abstracted [*V.B.* 27, 605].—R.M.

ANON. (1956). **Advisory group on veterinary public health. Report.**—*World Hlth Org. Tech. Rep.* Ser. No. 111, pp. 28. [Also available in French and Spanish.] 278

The Advisory Group defined the scope of the veterinarian in public health matters, of which the foremost were food hygiene and diseases transmissible from animals to man.

—R.M.

ANON. (1957). **Pasteur Institute of Southern India Coonoor. Golden Jubilee Souvenir 1907-1957.** pp. 150. Madras: Diocesan Press. 279

This publication briefly reviewed the scientific achievements and important observations made by the staff of the Pasteur Institute, Coonoor, (the second of the Pasteur Institutes set up in India, beginning with the Pasteur Institute at Kasauli, Punjab, established in

1900). It also included the scientific report for 1956-57.

Some 15,000 persons bitten by rabid animals (in 95% of cases by dogs in south India) annually undergo treatment for RABIES in the country. In Madras State the reported annual deaths from rabies have varied from 26 in 1916 to 1,475 in 1941; and 35-50.9% of persons who were bitten by proved rabid animals but failed to undergo treatment have died from rabies. On examination of brains of animals suspected to have died from rabies, 60-70% proved positive, and in 59.1% of these (or 39% of all presumably rabid animals) the virus was demonstrable in the submaxillary gland. For detecting Negri bodies, examination of the hippocampus major as well as the cerebellum and mid-brain gave more conclusive results than the hippocampus alone.

Till 1930, the Kasauli strain of fixed virus was employed for preparing Semple's phenolized rabbit-brain vaccine, but in subsequent years the antigenically superior Paris strain was used and the vaccine was a 5% sheep-brain suspension. Vaccine for about 30,000 human courses of treatment was issued annually by the Institute.

With a view to developing a vaccine which should be free from the toxic nervous tissue and also of high immunogenic value, attempts were made to cultivate the virus in synthetic media; but after some initial success the virus suddenly failed to multiply in the synthetic medium. The cause of this failure has been under intensive investigation, and it was suspected that the glycine used originally contained some unidentified impurity which was essential for growth of the virus.

Vaccine, as for human beings, was also issued for treatment of animals, mainly post-infection. Up to the end of 1955, 31,059 animals (including 20,471 dogs and 9,085 cattle) were treated, 3,769 of these in 1955. The overall mortality among 393 post-infection vaccinated dogs was 7.63% or 2.15% if animals dying within 15 days of the completion of treatment are included. The corresponding figures for 540 cattle similarly treated were 5.92%, or 0.78%.

In a series of experiments in g. pigs, anti-rabies serum prolonged the incubation period but had no protective value when given either before or after challenge with street virus; only serum from animals surviving infection with a particular type of challenge virus seemed to confer some protection against that virus; phenolized sheep-brain vaccine, given in doses com-

parable to those recommended for human beings, conferred solid protection against challenge with street virus 7 days after the commencement of treatment; and high-egg-passage Flury strain vaccine gave good results in pre-infection treatment, but not when administered (with antiserum) after infection with an Indian strain of street virus.

A survey using the complement-fixation test with Q FEVER (Italian strain—Henzerling) diagnostic antigen was undertaken in the Nilgiris and Coimbatore districts. Screening at 1:16

dilution indicated positive results in 7 of 99 human beings, 19 of 149 cows, 4 of 75 bullocks and 2 of 52 sheep, but in none of 6 buffaloes, 2 goats and 2 horses tested.

The other observations reported pertain to INFLUENZA, CHOLERA, TYPHOID FEVER, DIPH-
THERIA, FUSOSPIROCHAETOSIS, SYPHILIS, TROPICAL EOSINOPHILIA, MALARIA, LEISHMANIASIS, coagulation of blood, and venoms, and include observations on protozoa and arthropods.

—R. N. MOHAN.

See also absts. 42 (brucellosis in man from animals); 121 (urea content of muscle as indication of health or disease at time of slaughter); 233 (blood and meat spots in eggs).

LIVESTOCK HYGIENE

NUSSHAG, W. & BACHMANN, R. (1956). Modellversuche zum Studium der Lüfterneuerung und Luftbewegung in Tierställen. [**Studies of air replacement and air movements in animal stalls.**]—*Arch. exp. VetMed.* **10**, 882-894. **280**

The authors made models 1/10th of full size of byres having different ventilating systems, and with glass side walls. Air movements were observed after the model had been filled with a thick grey smoke. The best system had hopper-type windows in two opposite walls.—R.M.

REPRODUCTION AND REPRODUCTIVE DISORDERS

ANON. (1956). Netherlands. Jaarverslag K.I. 1955. Inhoudende het 10 Jaarverslag van de Centrale Commissie van toezicht op de uitvoering van de K.I. in Nederland en het 5 Jaarverslag van de Federatie van Provinciale Bonden van verenigingen voor K.I. bij rundvee in Nederland. [**Artificial insemination, Annual Report for 1955.**] pp. 79. Utrecht: Central Commissie de K.I. en het Federatie voor K.I. in Nederland. [English, French and German summaries.] **281**

ANON. (1957). Netherlands. Jaarverslag K.I. 1956. Inhoudende het 11^e Jaarverslag van de Centrale Commissie van toezicht op de uitvoering van de K.I. in Nederland en het 6^e Jaarverslag van de Federatie van Provinciale Bonden van verenigingen voor K.I. bij rundvee in Nederland. [**Artificial insemination, Annual Report for 1956.**] pp. 75. Utrecht: Centrale Commissie de K.I. en het Federatie voor K.I. in Nederland. [English, French and German summaries.] **282**

I & II. These comprise the 10th and 11th annual reports of the Central Committee for the Supervision of Artificial Insemination (A.I.) and the 5th and 6th annual reports of the Federation of Provincial Associations for A.I. of Cattle in the Netherlands. The number of cows inseminated was 899,000 in 1955 and 962,000 in 1956; semen from 1,098 bulls was used. Conception rate after first insemination averaged 60%. Regulations concerning the export of semen

were among the various administrative questions discussed. The incidence of trichomoniasis and vibriosis had decreased greatly since 1947: *V. fetus* was isolated from 11.6% of aborted foetuses in 1947/48 and from 1.9% in 1955/56 in the province of Friesland. Compulsory testing of A.I. bulls for blood groups was introduced in order that the paternity of calves may be determined when it is in doubt. The tests are performed at the Institute for Blood Group Studies in Wageningen. In 1956 nearly a thousand goats were inseminated. Experimental A.I. in pigs continued in the province of North Brabant: conception rates were unsatisfactory.

—R.M.

EHLERS, M. H. & ERB, R. E. (1956). **Metabolism of bull semen. V. Influence of dilution rate and time.**—*Tech. Bull. Wash. agric. Exp. Sta.* No. 20, pp. 40. **283**

A study of utilization of fructose and formation of lactic acid in diluted semen during incubation at 37°C., under varying conditions of dilution, diluent, and storage time.—R.M.

WHITE, I. G. (1957). **Metabolism of glycerol and similar compounds by bull spermatozoa.**—*Amer. J. Physiol.* **189**, 307-310. [Author's summary modified.] **284**

Actively motile washed bull spermatozoa metabolized glycerol aerobically, producing lactic acid and fructose. This process was

accompanied by increased oxygen uptake and decreased aerobic fructolysis. Dihydroxyacetone, but not phosphoglycerol, was oxidized at a similar rate and lactic acid was formed. Sorbitol was also oxidized by spermatozoa, producing lactic acid and fructose.

KRISHNA RAO, C. (1957). **Effect of fixatives on the staining and morphology of spermatozoa.**—*Vet. Rec.* **69**, 853-855. [Author's summary modified.] **285**

Ten methods of fixing semen smears were tested. Air-drying was as efficient as any, besides being simple and rapid. Staining and morphology were not affected by any method. Gentle flaming did not damage the spermatozoa. It was not necessary to refix smears after clearing.

OLDS, D. & VANDEMARK, N. L. (1957). **The behavior of spermatozoa in luminal fluids of bovine female genitalia.**—*Amer. J. vet. Res.* **18**, 603-607. [Authors' summary modified.] **286**

Genital organs were obtained from 16 cows slaughtered at known stages of the oestrous cycle and from 18 cows at unknown stages. The cervico-vaginal mucus, uterine fluid, oviduct fluid, and follicular fluid were used as diluents for bull semen. On the average, under relatively anaerobic conditions at 37°C., spermatozoa remained motile for about 9 hours in mucus, 7 hours in uterine fluid, 12 hours in oviduct fluid, and 19 hours in follicular fluid. In general, spermatozoa lived longer in mucus and uterine fluid from cows in or near oestrus. Oxygen uptake by spermatozoa was highest in follicular fluid followed, respectively, by oviduct fluid, mucus and uterine fluid. Agglutination of spermatozoa was frequently observed in all the fluids but most frequently in follicular fluid. No cyclic variation in this respect was apparent.

FRASER, A. F. (1957). **Intromission phobia in the bull.**—*Vet. Rec.* **69**, 621-623. **287**

The condition was described in 6 bulls of dairy breeds, in which a period of normal service was followed by disinclination to copulate. There was a strong sexual drive, but the bull dismounted in a very short space of time without serving the cow. Some features, such as lowering of the back and the pelvis, and the forward placing of the hind feet, recalled the fright posture. The ability to ejaculate into the artificial vagina was not lost. Frequent use of the artificial vagina, however, did not improve the natural mating behaviour. One bull was observed to be capable of serving at pasture.

Another could sometimes serve a heifer of lower stature if he were blindfolded. Administration of chloral hydrate, or placing the cow on a lower level did not improve the condition.—M.G.G.

AAMDAL, J. & HÖGSET, I. (1957). **Artificial insemination in swine.**—*J. Amer. vet. med. Ass.* **131**, 59-64. [Authors' summary modified.] **288**

Artificial insemination of pigs in Norway is described. The dummy sow, made of galvanised iron tubing, is stuffed and covered with changeable canvas. The artificial vagina is of the type used for bulls. The diluent consists of 3% sodium citrate plus 30% egg yolk, with 1,000,000 i.u. of penicillin and 1 g. of dihydrostreptomycin per 1,000 ml. The average dilution rate is 1:10. The diluted semen is stored at 15° to 20°C. Of 451 inseminations, using semen stored for 3-60 hours, 59.4% resulted in pregnancy, with an average of 10 pigs per litter. The insemination equipment consists of a plastic tube about 50 cm. long and 8 mm. in diameter, with an inflatable plastic balloon 4 cm. in diameter, 2 cm. from the tip of the tube, to block the cervical canal and prevent the semen from flowing back into the vagina. A flexible plastic bottle is used both as semen container and as insemination syringe.

NATH, V. (1956). **Cytology of spermatogenesis.** In *International Review of Cytology*. Vol. V. pp. 395-543. [London: Academic Books Ltd.] **289**

Controversy concerning the Golgi apparatus is ascribed by N. to failure to concentrate exclusively on the Flemming (without acetic acid and haematoxylin) technique, which avoids production of artefacts. Only a small part of the paper refers to mammalian—exclusively rodent spermatozoa in which there is evidence that the acrosome is secreted by the (granular) Golgi bodies. Living material was directly observed under the phase-contrast microscope. The veterinarian Zlotnik's work (1943-48) on carnivore and bull semen is reviewed. N. considers that neither the mitochondria nor the Golgi material (and the resultant acrosome) is essential to the fertilization process.—F. L. M. DAWSON.

HARTMAN, C. G. (1957). **How do sperms get into the uterus?**—*Fertil. & Steril.* **8**, 403-427. **290**

A critical review of the literature.—R.M.

ROWSON, L. E. & ADAMS, C. E. (1957). **An egg transfer experiment on sheep.**—*Vet. Rec.* **69**, 849-850. **291**

A Suffolk ewe was injected subcutaneously

13 days after oestrus with 900 i.u. of pregnant mare's serum (P.M.S.) to induce superovulation. She was mated when in oestrus 3 days later and 60 hours after the onset of oestrus four eggs were recovered from the fallopian tubes using the method described by Hunter *et al.* (1955) [*V.B.* **26**, 1029]. Two of the eggs were discarded as damaged; the other two were transferred to the uterus of one of 7 Suffolk ewes held as recipients, their oestrous cycles coinciding with that of the donor. Ten days later, the same donor ewe was given 1000 i.u. of P.M.S. After mating, 14 eggs were recovered, 13 of them being distributed amongst the other 6 recipient ewes. After a further 10 days the donor ewe was given 1200 i.u. of P.M.S. and was mated as before, but at laparotomy the ovaries were found to be covered with regressing corpora lutea, no ovulation having occurred. Of the 15 transferred ova, 10 developed normally to term, in addition to which the donor ewe produced a single lamb following natural mating.

—H. SCOTT McTAGGART.

SCHEEL, A. (1956). Über die Verwendung von Prolapsan in der Behandlung des Prolapsus vaginae beim Rind. [*Treatment of vaginal prolapse in cows with "Prolapsan".*]—*Wien. tierärztl. Mschr.* **43**, 818-827. [English, French and Italian summaries.] **292**

A clinical trial of "Prolapsan" (described as an alkali iodophenol sulphonate with inorganic halogen compounds) indicated a certain effectiveness in preventing recurrence of incomplete vaginal prolapse, when injected beneath the vaginal mucosa after reposition of the organ.

—R.M.

SCHOFIELD, B. M. (1957). The hormonal control of myometrial function during pregnancy. —*J. Physiol.* **138**, 1-10. [Abst. from author's summary.] **293**

It is concluded that myometrial contractility and reactivity are low during pregnancy owing to low levels of oestrogen and the protective action of high level of progesterone. Oestrogen secretion begins to rise about the middle of pregnancy, and on the last day of pregnancy progesterone levels fall sharply. Thus parturition occurs as a result of a change-over in hormone dominance from high progesterone and low oestrogen to high oestrogen and low progesterone levels.

CONZE, H. (1956). Action gonadotrope de l'extrait médullaire d'une persicaire *Polygonum cuspidatum*. [*Gonadotrophic activity*

of *Polygonum cuspidatum*.] — *C. R. Soc. Biol., Paris* **150**, 1386-1387. **294**

Normal saline extracts prepared from the pith of *P. cuspidatum* had gonadotrophic activity resembling that of human pregnancy urine when injected into rabbits. There appears to be a relationship between the rate of growth of the plant and the gonadotrophic activity of the extracts.—J. A. NICHOLSON.

SETINSKI, Z. & MILUNOVIĆ, M. (1957). Prilog poznavanju uzroka jalovosti naših kobila. [*Causes of sterility in mares.*]—*Vet. Arhiv.* **27**, 37-50. [In Croat. English and German summaries.] **295**

An account of examination of 435 mares from three stud farms and five villages, of which about 200 were infertile. In about 18 the cause of sterility was endometritis, ovarian cysts, etc. Infective agents were isolated from four. Ovarian dysfunction, due to overwork and inadequate food was the main cause of sterility. Organization of breeding in the villages was poor. Some owners had for various reasons failed to have their mares served at all.

Details were also given of 81 sterile mares examined at Zagreb. In 36 there were either lesions in the genital system or an infective agent was isolated; the remainder were negative bacteriologically as well as clinically.

Details concerning the isolation of *Str. zooepidemicus* from 20, bacteria of the *Coli* group from six, other micro-organisms from nine of 156 mares from an agricultural establishment, are also given.—E.G.

BRUNNER, H. (1956). Ein Beitrag zur Technik der Hodenbiopsie bei Rind und Schwein. [*Technique of testicular biopsy in cattle and pigs.*]—*Inaug. Diss., Munich* pp. 30. **296**

Testicular tissue obtained by excision was suitable for histological examination, but the operation was accompanied by severe bleeding in boars. Tissue obtained by inserting a Vim-Silverman needle into the testicle was not always histologically suitable nor representative of the whole testicle, and bleeding was also a problem in some cases.—R.M.

FÖLSTER, K. (1955). Die Diagnose des Kryptorchismus beim lebenden Schwein durch die rektale Palpation der Glandulae bulbourethrales. [*Diagnosis of cryptorchidism in the living pig by rectal palpation of the bulbourethral glands.*] — *Inaug. Diss., Hanover* pp. 35. **297**

Castrated pigs could be distinguished from

cryptorchids, from the 5th month of age, by rectal palpation of the bulbo-urethral glands. In castrates the glands were not more than 4 mm. in diameter (the thickness of a straw), while in cryptorchids they were at least 8 mm. in diam. (pencil thickness). Pigs castrated late in life could not be distinguished from cryptorchids by this method. These results confirmed those obtained by G. Vogel [*Tierärztl. Umsch.* 7, 189 (1952)].—R.M.

COHEN, P. (1956). Een statistisch onderzoek omtrent retentio secundinarum en enige andere, met de voortplanting samenhangende processen bij het rund. [*Statistical survey of retained placenta and other factors associated with bovine reproduction.*]—*Thesis, Utrecht* pp. 119. [English summary.] 298

C. discussed factors which may be responsible for retention of the placenta in cows. He also discussed the effect of the length of day on gestation and anoestrous periods.—R.M.

DYRENDahl, S. & HALLGREN, W. (1956). Nya fall av acroteriasis congenita inom Låglandsrasen. [*Recent cases of acroteriasis congenita in the Swedish Friesian breed.*]—*Nord. VetMed.* 8, 959-965. [In Swedish. English and German summaries.] 299

An illustrated account of 3 cases in calves, all born alive. In each case the head was shortened, there was hydrocephalus and the limbs were incomplete, ending at the distal end of the practically normal humerus and at the hock joint. One calf had a deformed tail. Diagrams trace the similarity of breeding in the 3 calves. The descent of the bull carrying the recessive predisposition was traced back to the first known carrier, a bull used widely at the end of the nineteenth century.—HUGH W. BOYD.

WHITTEM, J. H. (1957). Congenital abnormalities in calves: *Arthrogryposis* and *hydranencephaly*.—*J. Path. Bact.* 73, 375-387. [Author's summary slightly modified.] 300

Two congenital abnormalities of calves, arthrogryposis and blindness, both sometimes present in the same animal, appear to be increasing in incidence in New South Wales. In arthrogryposis the ventral horn cells of the affected regions of the spinal cord are absent or greatly reduced in number, with consequent atrophy and fatty replacement of the muscles supplied by them, and irregular contractures of the limbs. Blindness is associated with hydranencephaly particularly involving the cerebral hemispheres; the rhinencephalon is well pre-

served. It is suggested that both conditions are due to degenerative changes in normally developed nervous tissue. Various aetiological factors are speculatively considered, but no conclusions can be reached at present.

DYRENDahl, S. (1956). Epitheliogenesis imperfecta inom SRB-rasen. [*Epitheliogenesis imperfecta in Swedish Red-and-White cattle.*]—*Nord. VetMed.* 8, 953-958. [In Swedish. English and German summaries.] 301

D. reported 3 cases in calves of epitheliogenesis imperfecta manifested by lack of skin on the forelegs from just below the carpus to the hoof; immediately above the hoof was a ring of skin several cm. broad. Two of the calves died within two days of birth and the third was found dead after being born in the field. A diagram shows the similarity of the breeding of the 3 calves including one bull which was both maternal and paternal grandsire of all three. The defect seems to be caused by a recessive lethal factor.—HUGH W. BOYD.

GRÜNEBERG, H. (1956). An annotated catalogue of the mutant genes of the house mouse. —*Mem. med. Res. Coun.* No. 33, pp. 28. London: H. M. Stat. Off. 2s. 6d. 302

A list of 110 mutant genes, with brief accounts of the conditions caused by them.

—R.M.

DOBZHANSKY, T. (1957). Genetic loads in natural populations.—*Science* 126, 191-194. [Author's conclusion slightly modified.] 303

Any increase of mutation in human populations would increase the store of human misery. If anything, radiation-induced mutants are more destructive than spontaneous ones. As far as genetic effects are concerned, the only safe dose of high-energy radiation is no radiation. But beyond this, perhaps the most important lesson which the work on genetics of natural populations has taught us is one of humility. A satisfactory theory of population dynamics is not yet available. More data are needed on practically every aspect of populations genetics.

The genetic forces which impinge on human nature are not sufficiently understood for us to judge whether this nature is endangered, and if so to appraise how great the danger really is. Populations of various organisms will have to be studied. Of course, man is one of them. But it can hardly be overstressed that different organisms are most favourable for investigation

of different aspects of population genetics, and that progress would be obstructed or side-tracked by undue concentration. The way to-

wards understanding of biological aspects of human nature may lead through such lowly creatures as mice, drosophila, and even viruses.

See also *absts.* 50-53 (V. fetus infection); 70-71 (trichomoniasis); 108 (equine virus abortion); 116 (ovine virus abortion); 214 (foetal thyroid in normal and goitrous g. pigs); 216 (calcium blood levels in cows with parturient paresis); 217 (uptake of acetate by foetus); 264 (structure and function of the porcine uterus); 272 (effect of "TR", "TEM" & "TEPA" on rats *in utero*); 273 (effect of "2-0 DP", "CIP" and "ThG" on rats *in utero*); 316 (Transactions of conference on gestation); 317 (book, veterinary obstetrics).

ZOOTEC HNY

GEHRING, K. (1956). Zur Zucht und Haltung der weissen Maus. I. Beobachtungen zur Fortpflanzungsphysiologie. [Breeding and management of white mice. I. Observations on reproductive physiology.]—*Zbl. VetMed.*

3, 742-766. [English, French and Italian summaries.] 304

G. presented data on puberty, the oestrous cycle, gestation, litter size, lactation period and weight of young at weaning.—R.M.

TECHNIQUE AND APPARATUS

SMYTH, C. N. & BAINBRIDGE, M. N. (1957). A method of tabulating data for easy reference and appreciation of significant relationships.—*Brit. med. J.* September 14th, 619-623. [Authors' summary copied *verbatim*.] 305

A chart is presented upon which the substance of some hundreds of studies can be tabulated; the interrelations of factors can be discovered rapidly and the statistical reliability of the data verified at a glance. It will be useful particularly to those who have access to numerical data from punched-card filing systems. An obstetric example is given.

plete unit must be able to withstand mechanical and thermal shocks. For laboratory studies the culture should be visible. A leak-proof rotary seal and a bearing system with a long life are essential. The authors discussed at length aeration and mixing, size, control and measurement, joints, agitation and stirring systems, equipment for control of temperature and pH values and foaming, continuous flow system, harvesting system, air supply and bacterial filters, and technique of operation.—W.A.P.

ANON. (1956). Jet injection of joints.—*Lancet* 271, 1200-1201. 307

This is an annotation about an instrument, claimed to replace a conventional syringe and needle, the injection being introduced directly under pressure, subcutaneously, intramuscularly or into a joint. The medicament is contained in a sterile bulb and is forced through the skin and adjacent tissues as a very fine jet by means of a spring operated plunger. Only the nozzle of the syringe and the skin need be sterilized.

ELSWORTH, R., MEAKIN, L. R. P., PIRT, S. J. & CAPELL, G. H. (1956). A two litre scale continuous culture apparatus for micro-organisms.—*J. appl. Bact.* 19, 264-278. 306

Two principal types of apparatus are used for continuous culture. In the chemostat type fresh medium is fed at constant rate to the culture, the volume of the latter remaining constant. In the turbidostat type an automatic device admits more medium when the cell population has reached a predetermined level. With the chemostat apparatus control of the flow of medium has received much attention, but mechanical reliability, aeration, mixing, temperature control, control of foaming and pH value, freedom from secondary infection and the minimizing of laboratory infection require further investigation. The apparatus described had been in use for 1000 hours and is suitable for the growth of non-pathogens. The culture vessel should not be subject to corrosion over a wide range of pH values, or under oxidative conditions, and must resist exposure to steam at pressures up to 20 lb./sq. inch. The com-

In tests made a solution of a dye and a suspension of hydrocortisone acetate were injected into joints. The proportion of injected material that could be recovered by aspiration of the joint contents was up to 60% of the dye, but was much smaller for the hydrocortisone acetate, possibly, it is suggested, because much of it remained in the synovial membrane and peri-arterial tissues. Jet injection of radio-opaque medium confirmed that the material was deposited in the peri-arterial structures as well as within the joint cavity. It is suggested that this instrument is unlikely to compete seriously with the use of a syringe and accurately directly directed needle, until more elaborate trials have been made.—W.A.P.

See also *absts.* 6 (methods of injecting tuberculin); 11 (demonstration of tubercle bacilli in body fluids); 14 (rapid identification of acid-fast organisms); 35 (preparation of vaccines); 36 (milk plate-test in brucellosis); 48 (separation of clostridia from other organisms); 53 (cultivation of V. fetus); 91 (staining of Negri bodies); 95 (membrane piece technique in influenza research); 113 (propagation of bovine rhinotracheitis virus); 122 (estimation of size of swine fever virus); 146 (cultivation of viruses and rickettsia); 199 (Sulkowitch test for serum calcium); 224 (paper-electrophoresis in dog distemper and toxoplasmosis); 314 (book, post-mortem technique); 318 (book, microscopy).

MISCELLANEOUS

FIELDER, F. G. (1957). **Dermalon skin sutures—a comparison.**—*Thesis, Cornell* pp. 89. **308**

An attempt was made to determine the tissue reaction in the calf and dog to size O yellow-dyed Dermalon suture as compared to size O blue-dyed Dermalon suture. Observations were carried out on 20 calves and 10 dogs. The

sutures were implanted in the skin, subcutaneous tissues, and superficial skeletal musculature. As determined by histological evaluation and statistical appraisal F. concluded that there was no significant difference between the reactions induced by the two kinds of sutures when tested in calves and dogs.—H. L. GILMAN.

BOOK REVIEWS

GASTINEL, P. (1957). *Précis de bactériologie médicale.* [**Précis of medical bacteriology.**] pp. vii + 1243. Paris: Masson et Cie. 2nd Revised Edit. Fr. 6700. **309**

To the second edition of this work which was first published in 1949 [*V.B.* **20**, 535] many new chapters have been introduced, some have been omitted and amendments have been made in those retained. The subject matter is divided into the following main sections: General principles of bacteriology and immunology, bacteriological technique of examination of pathological material, bacteria pathogenic for man, *Spirochaetales*, *Rickettsia*, viruses, bacteriological examination of water (contributed by Professor A. Nevot) and antibiotics and antibiosis (contributed by Professor R. Fasquelle). The chapter on atypical pneumonias was contributed by Professor D. Christol, and that on bacteriophage by Dr. P. Nicolle. Selected references appear at the end of chapters. A very useful feature not always to be found in French text books is the volume index totalling 18 pages. The high standard of production of the first edition has been maintained.—E.G.

THIMANN, K. V. [Professor of Biology, Harvard University.] (1957). **The life of bacteria. Their growth, metabolism, and relationships.** pp. xviii + 775. New York (& London): The Macmillan Company. 65s. **310**

This book is written mainly for advanced students of microbiology and, as stated by the author, is an attempt to see bacteriology as a whole.

Parts 1 and 4, dealing respectively with the morphology and general physiology of bacteria and their growth and synthesis are generally well written and comprehensive, the chapter dealing with classification being particularly valuable. A few minor points of criticism might be mentioned. For example it is stated on p.105 that the S→R variation is due to the loss of the capsule which is also responsible for virulence. This statement would appear to need consider-

able qualification, as virulence depends on a number of other factors. It is also stated that antibodies are produced by the walls of blood vessels and that the purified pneumococcus polysaccharide is antigenic in rabbits.

Parts 2 and 3 are concerned with the role of micro-organisms in the nitrogen cycle and the metabolism of carbohydrates and require a good working knowledge of organic chemistry for their understanding.

There is a comprehensive list of references at the end of each chapter; this enhances the value of the book to all those interested in bacteriology in all its aspects.—W. J. B. MORGAN.

CLIFTON, C. E., RAFFEL, S. & STANIER, R. Y. [Edited by.] (1957). **Annual review of microbiology.** Vol. 11. pp. vii + 536. Palo Alto, California: Annual Reviews, Inc. \$7.50. **311**

This volume, as is usual in this excellent series, covers a wide variety of subjects.

Veterinarians will find the following contributions of special interest and value. "Variations in animal viruses" by Edney, M., "Nutrition of bacteria and fungi" by Magasanik, B., "Chemotherapy of viral and rickettsial diseases" by Horsfall, F. L., Jr. & Tamm, I., "Use of tissue cultures in virus research" by Ross, J. D. & Syverton, J. T.

Other very useful papers of more general interest are "A review of the microbiological and immunological literature published in 1956 in the U.S.S.R."; "Bacterial genetics"; "Genetics of the protozoa" and "The homograft reaction".

— (1956). **Diagnostic procedures for virus and rickettsial diseases.** pp. xv + 578. New York: American Public Health Association. 2nd Edit. \$7.50. **312**

The 2nd Edition of this very well known book contains four new chapters dealing with tissue culture methods for cultivation of viruses, general principles underlying diagnosis, Coxsackie viruses and with miscellaneous virus diseases. Although the book is written for

medical men and deals only with diseases affecting man there is much of interest and value to those working with the virus diseases of livestock and it should be in every veterinary laboratory.

TERENT'EV, F. A. & MARKOV, A. A. [Edited by.] (1956). [**Infectious and invasive diseases of cattle.**] pp. 631. Moscow: Gosud. izd. sel'skokhoz. literaturui. 17r. 50k. **313**

This is an outstanding Russian text-book on the infectious diseases (bacteria, viruses and fungi) and invasive diseases (protozoa, helminths, arthropods) of cattle. It comprises a collection of monographs by various authors, in which each disease is dealt with under the headings, history, distribution, aetiology, epidemiology, symptoms, pathology, diagnosis, treatment, immunity, and control. There is a bibliography at the end of each chapter—a rare feature in Russian books. Many chapters are of special interest because they contain information not widely known outside the U.S.S.R., or because they describe vaccines, control methods or diagnostic tests currently employed in that country. Examples are the chapters on leptospirosis (by S. Y. Lyubashenko), vibriosis (P. A. Trilenko), brucellosis (E. S. Orlov), foot and mouth disease (L. S. Ratner), rabies (V. N. Syurin) and clavi-ceps toxicosis (A. K. Sarkisov).

The section on protozoal diseases, by I. V. Abramov, clarifies the distribution and relative importance of trichomoniasis, piroplasmosis and theileriosis in the U.S.S.R., and mentions the new drugs now being used for treatment. In the section on helminth parasites, by D. N. Antipin, there are separate accounts of *Fasciola*, *Dictyo-caulus*, *Momezia*, *Thelazia*, *Echinococcus*, *Cysticercus*, *Neoscaris*, *Paramphistomum*, *Mecistocirrhus* and *Dicrocoelium*. The quality of the paper and the binding is unusually good, but the illustrations are rather poor. The book costs about 12s. 6d. in the United Kingdom. It will provide a standard source of reference to diseases of cattle in the U.S.S.R.—R.M.

DOBBERSTEIN, J. (1957). Richtlinien für die Sektion der Haustiere. [**Technique of post-mortem examination of the domestic animals.**] pp. 125. Berlin (& Hamburg): Paul Parey. 8th Edit. DM 13.80. **314**

Since the publication of the first edition in 1936, this book has evolved into a very competent and practical guide to the technique of post-mortem examination of all the domesticated mammals and the fowl. It describes, for each animal, a system of observing pathological changes at each stage of examination. There is additional information on the handling of

material for lab. examination (with a special chapter on poisoning), the writing of a P.M. report, determination of age, and average size and weight of organs. This 8th edition differs from the previous (1950) edition mainly in the vastly improved layout and paper, but there are many improvements to the text itself.—R.M.

CUNHA, T. J. [Professor and Head, Department of Animal Husbandry and Nutrition University of Florida.] (1957). **Swine feeding and nutrition.** pp. xv+296. New York (& London): Interscience Publishers. \$5.00. **315**

This is the first volume of a series on animal nutrition. It is essentially a concise review of recent American literature, designed for "beginners in swine production, established swine raisers" and others. Information on the nutrients required by pigs and the nutritive value of food-stuffs is neatly summarized, with ample reference to deficiency diseases. The rations given are those recommended by various Agricultural Experiment Stations. Each chapter has a bibliography.—R.M.

VILLEE, C. A. [Edited by.] (1957). **Gestation. Transactions of the third conference, March, 6, 7 and 8, 1956. Princeton, N.J. [Sponsored by the Josiah Macy, Jr. Foundation.]** pp. 253. New York: Josiah Macy, Jr. Foundation. \$4.75. **316**

The presentations cover a wide field of research—anatomy, physiology and biochemistry—but essentially the problem is one of endocrine secretions and functions both in the mother and foetus.

Each paper deals with a restricted topic. However, questions and group discussions give a wider and more stimulating approach to the subject. This conference technique has much in its favour, but confusion can result from interruptions by discussions. This is particularly noticeable in Dr. A. Jost's excellent paper "The secretory activities of foetal endocrine glands and their effect upon target organs."

Two points, of minor importance to the subject of this publication, brought out in the group discussions have wider interest in the field of endocrinology. The first refers to stress. Dr. Zarrow, in an interesting paper (Maternal hormones in pregnancy), suggests that the adrenal gland is a possible source of serum progesterone at the time of parturition. He then continues: "This would agree with the concept that parturition is a stressful phenomenon . . ." Dr. Engle further defined this term by referring to it as "adrenal stress." By this is apparently meant

that there is increased adrenal secretion. Such a specialized use of "stress" has little to recommend it, and can lead to considerable confusion. The second point concerns the meaning of "hormone." There seems to be no satisfactory definition of this term. Indeed, according to one definition, carbon dioxide would become a hormone. As Dr. Witschi points out: "... we all use different connotations side by side and change our ideas according to the case. That is why we become involved in these controversies."

This book should be of great interest to all workers engaged in research on gestation.

—N. SABA.

DERIVAUX, J. (1957). *Obstétrique vétérinaire*. [**Veterinary obstetrics.**] pp. 392. Paris: Vigot Frères. Fr. 3500. **317**

This is a good workmanlike production, intended for general practitioners and students. It is eminently readable and covers quite a wide field, including the diagnosis, physiology and pathology of pregnancy; and the detailed technique of anaesthesia for obstetrical purposes, as well as the treatment of dystokia. The pathology of the puerperal period is also considered in some detail, while that of the new-born animal is briefly dealt with. There is an interesting discussion on the endocrinology of milk secretion. As the author sees annually an average of 250 dystokia cases in large animals, this section is one of the best in the book; embryotomy is greatly favoured in preference to alternative procedures. The illustrations of instruments are excellent, but the photographs of operation sites and of dissected-out organs could be clearer. There are perhaps too many spectacular monstrosities. Removal of the retained placenta in the cow is recommended before the 48th hour and the importance is stressed of genital infection with *Fusiformis* and gas gangrene organisms, which is perhaps less common in Great Britain. Mention is made of problems affecting the dog, cat, and rabbit, but most of the information relates to the farm animals.

Regarding early pregnancy diagnosis in the

cow, the statement that the corpus luteum of pregnancy is much larger than the dioestrous one, conflicts with the bulk of available evidence. The estimate of 90% efficiency of rectal pregnancy diagnosis at 9 weeks seems low, especially when contrasted with the alleged practicability of 30-day rectal diagnosis in the mare by the non-specialist. Disproportionate space is given to the possibilities of rheological diagnosis of bovine pregnancy, considering that emphasis is laid on its practical value from four weeks onward. Yet the failure to consider the work of Coluzzi (1953) improving on that of Garm & Skjerven (1952), is evidence of failure to read widely enough on this aspect, while the real possibilities of definitive diagnosis at eight days by temperature shift (Vollmann, 1942; Micheletto, 1956) are not mentioned at all. The colour-marking evidence on the occurrence of superfoetation, which is thought not to exist, is ignored. Throughout the work there is failure to include many of the text references in the terminal bibliography.

—F. L. M. DAWSON.

VICKERS, A. E. J. [Edited by.] (1956). **Modern methods of microscopy. A series of papers reprinted from 'Research'.** pp. iii + 114. London: Butterworths Scientific Publications. 15s. **318**

This book is a collection of papers originally published serially in *Research*. Each deals in a general way with specialized branches of microscopy (fluorescence, X-ray, polarizing, interference etc.), or more specifically with recent developments (e.g. electron microscopy, reflecting microscopes), or practical aspects (an essay on numerical values and quantitative determinations) and each is written by an acknowledged expert on the subject.

Anyone who wants a good, up-to-date grounding in the many different branches of modern microscopy (and who has a sound understanding of mathematics) will find this little book interesting, instructive and useful. The numerous references given by the authors are a particularly useful feature.—L. M. MARKSON.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review.]

BÖHM, R. & PLEVA, V. (1956). *Mikroskopie masa a surovin živočišného původu*. [**Microscopy of meat and animal products.**] pp. 174. Prague: State Publishers of Technical Literature.

FRASER, A. & STAMP, J. T. (1957). *Sheep hus-*

bandry and diseases. pp. xii + 444. London: Crosby Lockwood & Son, Ltd. 35s.

NICHOLS, J. E. (1957). *Livestock improvement—in relation to heredity and environment*. pp. ix + 240. Edinburgh (& London): Oliver & Boyd. 4th Edit. 16s.

PAWSON, H. C. (1957). **Robert Bakewell. Pioneer livestock breeder.** pp. xv+200. London: Crosby Lockwood & Son, Ltd. 25s.

PRIGGE, R. & HEYMANN, G. (1957). *Grundlagen und Möglichkeiten der Tuberkuloseschutzimpfung. [Immunization against TB, in man.]* pp. 95. Munich (Berlin & Vienna): Urban & Schwarzenberg. DM 9.80.

ROBERTS, G. FULTON. (1957). **Comparative aspects of haemolytic disease of the newborn.** pp. xi+199. London: William Heinemann. 17s. 6d.

SMITH, H. A. & JONES, T. C. (1957). **Veterinary pathology.** pp. 959. London: Henry Kimpton. 130s.

SMITHCORS, J. F. (1957). **Evolution of the veterinary art. A narrative account to 1850.**

pp. xvii+408. Kansas City: Veterinary Medicine Publishing Co. \$6.50.

— (1957). **Index of agricultural research 1957.** pp. xic+189. Cambridge: University Press for Agricultural Research Council. 12s. 6d.

— (1957). **Diseases of farm livestock. Section VI. The husbandry and diseases of calves.** pp. 94. London: British Veterinary Association.

JACQUET, R., LE BARS, H. & SIMONNET, H. (1958). *Nutrition animale. Biologie, physiologie et alimentation rationnelle. Volume I. Données générales sur la nutrition et l'alimentation. [Animal nutrition. Volume I. General aspects.]* pp. 472. Paris: Baillière et fils.

SOME RECENT PUBLICATIONS OF THE COMMONWEALTH BUREAU OF ANIMAL HEALTH

NEOPLASMS OF THE DOMESTICATED MAMMALS

by E. COTCHIN, M.R.C.V.S., *Royal Veterinary College, London*

Crown 4to stiff cover pp.xv + 100

A comprehensive review covering mainly the period from 1932 onwards.
950 references

Price 20s.

SALMONELLOSIS IN ANIMALS

by A. BUXTON, PhD., M.R.C.V.S., *Dept. Vety. Pathology, University of Liverpool*

Medium 8vo stiff cover pp.v + 209

A comprehensive review covering domestic animals, poultry, fur-bearing animals, rodents, reptiles and arthropods.

1,750 references

Price 25s.

VETERINARY REVIEWS AND ANNOTATIONS

A half-yearly review of topical subjects.

Annual Subscription 25s.

All the above obtainable from:—

Central Sales Branch, COMMONWEALTH AGRICULTURAL BUREAUX, Farnham Royal,
Nr. Slough, Bucks, England.

CONTENTS

	<i>Page</i>
Diseases Caused by Bacteria and Fungi	57
Diseases Caused by Protozoan Parasites	70
Diseases Caused by Viruses and Rickettsia	71
Immunity	79
Parasites in Relation to Disease [Arthropods]	81
Parasites in Relation to Disease [Helminths]	83
Spontaneous and Transmissible Neoplasms and Leucaemias [Including Fowl Paralysis]	85
Nutritional and Metabolic Disorders	87
Diseases, General	94
Poisons and Poisoning	96
Pharmacology and General Therapeutics	97
Physiology, Anatomy and Biochemistry	100
Public Health, Veterinary Services and Veterinary Education	103
Livestock Hygiene	103
Reproduction and Reproductive Disorders	104
Zootechny	106
Technique and Apparatus	108
Reports	108
Book Reviews	109
Books Received	109

INDEX TO AUTHORS

- Abdussalam, M., 424.
 Abinanti, F. R., 455.
 Adams, J. M., 444.
 Adams, K. M., 458.
 Adler, H. E., 394.
 Adler, J. H., 546.
 Aines, P. D., 528.
 Airapetyan, V. G., 372.
 Aitken, J. N., 630.
 Alldrich, R. A., 641.
 Allan, D., 487.
 Allcroft, R., 522.
 Allden, W. G., 509.
 Allen, A. M., 478.
 Allen, J. R., 535.
 Allen, R. S., 511.
 Anderson, D. E., 497.
 Anderson, R. A., 509.
 Andleigh, H. S., 393.
 Andral, L., 498.
 Anna, E., 463.
 Ansell, B. M., 531.
 Antliff, H. R., 619.
 Arbib, G., 627.
 D'Arcees, P. J., 627.
 Archer, R. K., 584, 596, 611.
 Aschbacher, P. W., 613.
 Autrey, K. M., 508.
- Babcock, M. J., 575.
 Bachrach, H. L., 408.
 Baecht, W. R., 535.
 Bain, A. M., 626.
 Baker, B. L., 602.
 Baker, D., 486.
 Baker, W. H., 504.
 Balch, C. C., 524.
 Balch, R. K., 493.
 Baluda, M. A., 439.
 Bankowski, R. A., 442.
 Barkham, P., 596.
 Barnes, E. G., 491.
 Baxter, J. T., 487, 490.
 Behrens, H., 527.
 Bélanger, L. F., 525.
 Bellesia, L., 599.
 Bendixen, H. J., 501.
 Benson, R. E., 329.
 Benzie, D., p. 109.
 Berg, J., 394.
 Berktemirov, T. A., 449.
 Berlin, N. I., 568.
 Bernhard, W., 500.
 Berry, D. M., 586.
 Bertaud, W. S., 376.
 Bethcke, H. J., 370.
 Bialy, G., 616.
 Bielez, P., 423.
 Bieri, J. G., 537.
 Biggs, P. M., 588.
 Blake, J. T., 511.
 Blakemore, F., 532.
 Blaxland, J. D., 565.
 Blincoe, C., 623.
 Roda, J. M., 513.
 Boerma, F. W., 459.
 Bogdashev, N. F., 504.
 Bogen, E., 333.
 Bond, T. E., 608.
 Bond, V. P., 387.
 van den Born, J. M., 643.
 Bradley, G. M., 352.
 Brammell, W. S., 564.
 Bras, G., 566.
 Breese, S. S., Jr., 408.
 Brennan, D. M., 536.
 Briggs, G. M., 537.
 Brinkman, D. C., 624.
 Brody, S., 589, 590.
 Brooks, M. E., 377.
 Brown, R. E., 397, 519, 544.
 Brownlee, A., 637.
 Bryant, J., 512.
 Buck, W. B., 581.
 Buddle, M. B., 371.
 Burge, G. J., 590.
 Burgisser, H., 327, 503.
 Burke, D. C., 448.
 Burrows, D., 499.
 Butler, E. J., 552.
- Calhoun, C. L., 334.
 Callis, J. J., 408.
 Cameron, H. S., 517.
 Campbell, D. J., 488.
- Campbell, E. A., 561.
 Carnaghan, R. B., 565.
 Carroll, F. D., 629.
 Carter, G. R., 345.
 Castro, E. R., 398.
 Chamberlain, R. W., 416.
 Chambers, D., 497.
 Chance, H. L., 353.
 Chandler, R. L., 337.
 Chappaz, G., page 109.
 Chen, K. H., 574.
 Cherry, S. H., 559.
 Chevrier, L., 413.
 Chien, S., 559.
 Chin, P. H., 387.
 Clarnbold, P. J., 458, 467.
 Clegg, M. T., 629.
 Cole, H. H., 513.
 Coltery, L., 560.
 Colvin, H. W., Jr., 513.
 Coombs, R. R. A., 465.
 Cooper, M. S., 378.
 Cowie, R. S., 625.
 Craft, C. E., 468.
 Cresswell, E., 600.
 Crichton, J. A., 630, 631.
 Cronin, M. T. I., 344.
 Cuckler, A. C., 402.
 Cunningham, M. P., 375.
- Daigler, A., 359.
 Dale, H. E., 367, 590.
 Davies, L., 471.
 Davis, L. L., 633.
 Davis, O. S., 570.
 DeCosta, L. C., 505.
 Dedié, K., 383.
 Denton, D. A., 529.
 Diernhofer, K., 355.
 Dieter, R., 326.
 Dillon, R. D., 512.
 Djang, A. H. K., 336.
 Dobson, H. L., 635.
 Dodds, C., page 109.
 Doyle, L. P., 570.
 Drewniak, E. E., 633.
 Driver, F. C., 366.
 Duncan, D. O., 534.
 Dunnet, G. M., 607.
 Dzhilavyan, K. A., 401.
- Eddy, G. W., 473.
 Eden, E., 532.
 Ehrentreich, F., 481.
 Elam, C. J., 530.
 Elberg, S. S., 386.
 Elder, J. M., 379.
 Eliseev, A. P., 594.
 Elliot, J., 347.
 Elliott, D. C., 485.
 Elmlinger, P. J., 558.
 El'tsov, S. G., 604.
 Ely, F., 614.
 English, J. E., 367.
 Ensor, C. R., 384.
 Erb, R. E., 624.
 Van Erkel, G. A., 525.
 Ershoff, B. H., 541.
 Etgen, W. M., 614.
 Evans, C. Lovatt, 549.
- Fain, A., 477.
 Fantl, P., 597.
 Fastier, L. B., 425, 432.
 Federova, N. I., 451.
 Fells, G., 360.
 Fieldsteel, A. H., 433.
 Fish, N. A., 373.
 Fitzpatrick, R. J., 585.
 Flatt, W. P., 505.
 Fogg, D. E., 402.
 Fong, J., 386.
 Fonseca, J., 493.
 Forbes, R. M., 519.
 Fosgate, O. T., 613.
 Fremming, B. D., 329.
 Fritzsche, K., 346.
 Froman, S., 333.
 Fulton, J. D., 468.
- Gaggero C., A., 407.
 Garry-Anderson, A.-S., 554.
 Gengozian, N., 461.
 Gentles, J. C., 391.
 Geoffroy, M., 382.
- Georg, L. K., 392.
 Gibson, E. A., 491.
 Gibson, J. B., 499.
 Gill, J. C., 631.
 Gitter, M., 350.
 Glättli, H. R., 547.
 Godfrey, D. G., 403.
 Goldberg, L., 523.
 Goldwasser, R., 440.
 Goodban, J. W. D., 642.
 Goodwin, R. F. W., 465, 620.
 Gorham, J. R., 431.
 Gorski, J., 624.
 Goulson, H. T., 480.
 Graber, M., 476.
 Grant, A. B., 633.
 Grant, J. H., 620.
 Gray, M. L., 342, 343.
 Greenman, V., 387.
 Gregersen, M. I., 559.
 Grimsson, H., 426.
 Gringer, L., 373.
 Gritenko, A. K., 449.
 Gross, W. B., 351.
 Gross, W. O., 633.
 Guralp, N., 486.
 Guillaumie, M., 382.
 Gutierrez, J. C., 431.
 György, P., 566.
- Habel, K., 414.
 Haggard, J. M., 506.
 Halvorson, H. O., 381.
 Ham, W. E., 530.
 Harada, K., 427.
 Hare, W. O. D., 587.
 Harris, M. D., Jr., 329.
 Harris, P. N., 574.
 Harris, W. E., 468.
 Harris-Smith, P. W., 324.
 Haurowitz, P., 462.
 Hawkins, G. E., 508.
 Hawley, G. E., 422.
 Hawthorne, V. M., 330.
 Head, M. J., 524.
 Heisch, R. B., 456.
 Hemmings, W. A., 592.
 Hess, E. A., 614.
 Hess, W. R., 408.
 Hill, H. J., 396.
 Hinshaw, L. B., 352.
 Hitchner, S. B., 441.
 Hitzman, D. O., 381.
 Hobson, D., 358.
 Hoe, C. M., 577.
 Hoefler, J. A., 564.
 Holbrook, A. A., 430.
 Holt, A. P., 559.
 Hopkins, T. I., 473.
 Hopwood, M. L., 398.
 Horrocks, D., 545.
 Horvath, D. J., 505.
 Hoskins, H. P., 646.
 Houck, J. C., 605.
 Howell, D. G., 347.
 Howell, J., 338.
 Hoyt, A., 396.
 Hunk, R. A., 420.
 Hudson, C. B., 361.
 Huppert, M., 339, 340.
 Hutchens, T. T., 641.
- Imagawa, D. T., 444.
 Inaba, Y., 427.
 Ingle, D. J., 602.
 Irwin, C. F. P., 390.
 Isaacs, A., 446, 447, 448.
 Ishii, S., 427.
 Ittner, N. R., 608.
 Ivashkov, I. S., 470.
 Ives, J. C. J., 375.
- Jackson, H. D., 515.
 Jacobson, N. L., 511.
 Jakerow, A., 525.
 Jameson, J. E., 362, 368.
 Jarrett, W. F. H., 330, 551.
 Joyner, J. W., 334.
 Juarez, W. J., 340.
- Kabaev, K., 415.
 Kantorovich, R. A., 434.
 Kaplan, W., 413.
 Kark, R. M., 531.
 Kast, A., 495.
- Kaufman, B., 519.
 Kauker, E., 437.
 Keep, J. M., 568.
 Kelch, F., 380.
 Kelly, C. F., 608.
 Kendall, K. A., 623.
 Kendall, S. B., page 110.
 Keppie, J., 324.
 Khachatryan, A. B., 372.
 Kibler, H. H., 589.
 King, A. S., 588.
 Kirschner, L., 376.
 Kisitsina, L. I., 449.
 Klein, H., 356.
 Köhler, H., 553.
 Kötsche, W., 429.
 Kohn, A., 440.
 Komarov, A., 409.
 Kotula, A. W., 633.
 Krasnow, I., 333, 339.
 Kratzer, F. H., 540.
 Kraus, H., 395.
 Kréméry, V., 369.
 Kréguer, A., 382.
- Lacroix, J. V., 646.
 Lamanna, C., 457.
 Lancefield, E. C., 322.
 Lantz, F. H., 540.
 Larrabee, W. L., 610.
 Larsh, J. E., Jr., 490.
 Larski, Z., 428.
 Larson, B. L., 623.
 Lauder, I., 390.
 Lawrence, J. H., 558.
 Leach, B. F., 493.
 Lindenmann, J., 446, 447, 448.
 Line, C., 524.
 Lipanowicz, J., 474.
 Love, G. J., 392.
 Ludwick, I. M., 614.
 Luecke, R. W., 564.
 Lukin, L., 559.
 Lush, J. L., 497.
 Luvarghi, E., 599.
 Lutz, A., 580.
 Lyne, A. G., 591.
- McCance, R. A., 593.
 McCandless, E. L., 571.
 McClure, T. J., 423.
 McCrea, M. R., 339.
 McDonald, I. R., 529.
 MacDonald, L. E., 618.
 McDonald, M. W., 534.
 McGowan, B., 517.
 MacGregor, K. L., 563.
 McIntyre, W. I. M., 375.
 McKenna, J. M., 400.
 Maddy, K. T., 383.
 Magee, P. N., 573.
 Magnani, G., 538.
 Maguire, T., 376.
 Mann, T., 611.
 Mansi, W., 445.
 Manwell, R. D., 404.
 Marmion, B. P., 455.
 Marr, A. G., 597.
 Marsboom, R., 399.
 Marshak, R. R., 543.
 Martin, L. E., 523.
 Martin, W. B., 330, 433.
 Martinčić, M., 567.
 Martini, F. V., 378.
 Masouredis, S. P., 562.
 Matrone, G., 507.
 Matthews, P. R. J., 319.
 Mathiesen, M., 464.
 Matumoto, M., 427.
 Maupoum, R., 612.
 Mayer, K., 646.
 Mezinnis, P., 543.
 Meléndez V., L., 407.
 Mellors, R. C., 436.
 Menges, R. W., 392.
 Miles, A. A., 379.
 Miller, W. C., 611.
 Milstrey, R., 536.
 Mlner, J. P., 595.
 Moran, A. B., 344.
 Moore, E. N., 567, 569.
 Moore, T., 532.
 Morimoto, T., 427.

Author Index

- Morrison, S. M., 396.
Morse, E. V., 341.
Muttic, M. K., 335.
Muir, R. W., 625.
Mykutowycz, R., 435, 475.
- Naletov, N. A., 328.
Nelson, W. O., 397, 519.
Nermut, M. V., 348.
Netter, A., page 109.
Newberne, J. W., 466.
Newberne, P. M., 581.
Nichols, R. E., 512, 514.
Nikiforov, N. I., 604.
Nikolitch, M., 412.
Nisbet, A. M., 549.
Nisbet, D. I., 552.
Nitzschke, E., 419.
Nižnansky F., 369.
Nóbrega, P., page 109.
Norambuena G., M., 407.
Noyes, W. F., 436.
- Oakley, C. L., 592.
Oberling, C., 500.
O'Flaherty, F., 634.
O'Hara, P. B., 533.
Ohshima, K., 496.
Okuneva, L. E., 452.
Oks, D., 622.
Oliver, W. T., 563.
Omori, T., 427.
Ono, H., 496.
Oppermann, R., 397.
Osborne, A. D., 389.
O'Sullivan, J. G., 391.
Ott, R. L., 431.
Ott, W. H., 402.
Ottaway, C. W., 532.
- Palmer, D. F., 418.
Pálsson, P. H., 426.
Parker, W. H., 439.
Parkes, A. S., 615.
Paterson, J. Y. F., 545.
Patsko, L. V., 452.
Pattanyak, S., 494.
Patterson, E. L., 536.
Patterson, W. C., 430.
Pattison, I. H., 319, 347.
Patty, R. E., 408.
Pearce, R. H., 605.
Penn, K., 512, 514.
Pen, N., 462.
Personeus, G. R., 378.
Peterson, K., 405.
Phillipson, A. T., 539, page 109.
Pipes, G. W., 542.
Pivnyak, I. G., 364.
Placidi, L., 413.
Pogosyan, A. A., 372.
Portway, B., 510.
Premachandra, B. N., 542.
Pritchard, W. R., 570.
- Rac, R., 390.
Raghavan, N. G. A., 494.
Raker, C. W., 572.
Ramsey, H. A., 507.
Read, C. P., 400.
Rees, T. A., 349.
Reid, R. S., 539.
Reiffel, L., 531.
Reis, J., page 109.
Reiss, J., 332.
Rezvuikh, A. I., 415.
Rice, C. E., 463.
Rice, W. G., 493.
Richardson, U. F., page 110.
Richert, D. A., 526.
Rickard, H. E., 614.
Rising-Moore, F., 466.
Ritchie, H. E., 576.
Robbins, W. E., 473.
Roberts, G. B. S., 330.
Roberts, G. Fulton, 644.
Roberts, S. J., 421.
Robertson, J. M., 552.
Robinson, V. B., 466.
Rodbard, S., 516.
Roddy, W. T., 634.
Rodríguez y Feliz, M. D., 578.
Rodríguez T., R., 407.
Röhrer, H., 410.
Roepke, M. H., 366.
Romanova, V. P., 450.
Romanowska, M., 582.
Roncalli, R., 583.
Rook, J. A. F., 524.
Root, W. S., 559.
Rose, C. L., 574.
Rose, M., 612.
Ross, J. M., 323.
Ross, K. A., 549.
Rotov, I. V., 363.
Rott, R., 419.
Rowland, S. J., 524.
Rowley, L., 606.
- Sabina, L. R., 639.
Safarov, K. M., 374.
Sampson, J., 618.
Sanger, V. L., 569.
Saunders, L. Z., 557.
Schmidt, D. A., 564.
Schmidt-Hoensdorf, F., 481.
Schneider, B. H., 530.
Schneider, P., 386.
Schneider, P. A., 327.
Schönberg, F., page 110.
Schoental, R., 573.
Schreiber, J., 512, 514.
Schultze, A. B., 598.
Schwarz, K., 537.
Scott, M. L., 537.
Seadale, E. H., 443.
Seelemann, M., 406.
Sellers, K. C., 532.
Shannon, R., 354.
Shaw, J. C., 544.
- Shaw, R. A., 515.
Shklyayev, I. P., 415.
Short, R. V., 611.
Siegert, R., 437.
Sigurdsson, B., 426.
Silich, V. A., 454.
Siller, W. G., 621.
Silver, B. S., 513.
Silverman, M. S., 387.
Sinclair, A. N., 385.
Smith, C. R., 336.
Smith, H., 324.
Smith, J. P., 523.
Smith, S. E., 523.
Smith, T. C., 632.
Smith, V. R., 613, 616.
Smith, W. W., 392.
Sobey, W. R., 458, 467.
Soulsby, E. J. L., 479, 484.
Splitter, E. J., 398.
Sprague, M. A., 610.
Stafoeth, H. J., 343.
Staskiewicz, G., 582.
Stellmacher, W., 357.
Stephenson, M. L., 504.
Sterne, M., 377.
Stevens, K. M., 460.
Stewart, D. G., 505.
Stiles, F. C., Jr., 366.
Stokstad, E. L. R., 536.
Stone, C. A., 531.
Storti, E., 599.
Suarez, F. P., 579.
Sudia, W. D., 416.
Sullivan, L. W., 682.
Summa, H., 370.
Sury, A., 423.
Symons, L. E. A., 482.
- Talman, E. L., 641.
Tamate, H., 603.
Tancous, J. J., 634.
Tarasevich, I. V., 453.
Taylor, D. B., 570.
Taylor, M. W., 575.
Telenkov, P. F., 449.
Thomas, B. A. C., 483.
Thomas, P. L., 485.
Thompson, H. J., 609.
Thomson, W., 631.
Thorp, F., Jr., 343.
Tobin, A. J., Jr., 341.
Tokumaru, T., 411.
Tomlin, S. C., 596.
van Tongeren, H. A. E., 640.
Topolnik, E., 438.
Townsend, S. M., 332.
Trautwein, G., 320.
Trueblood, M. S., 396.
Truszczyński, M., 321.
Tsuda, T., 601.
Tudor, D. C., 361.
Turner, C. W., 542, 595.
Tyler, W. J., 613.
- Udenfriend, S., 469.
Ukita, T., 381.
Ulbrich, F., 638.
Underdahl, N. R., 636, 639.
Urgunhart, G. M., 483.
- Valentine, R. C., 447.
VanDemark, N. L., 622.
Velu, H., 580.
Vigier, P., 500.
Voronin, M. V., 470.
- Waalkes, T. P., 469.
Walden, N. B., 355.
Walker, D., 560.
Walton, A., 611, 617.
Warner, R. G., 505.
Warrack, G. H., 377.
Wasz-Höckert, O., 331.
Wayne, L. G., 339, 340.
Webster, W. M., 600.
Weir, W. C., 517.
Weissbach, H., 469.
Weller, R. A., 521.
Westerfield, W. W., 526.
Wetherill, G. D., 438.
White, P. G., 441.
White, T. G., 366.
Whitlock, H. V., 492.
Whitem, J. H., 550.
Widdowson, E. M., 593.
Wiedner, W., 472.
Wiesner, E., 502.
Wilkinson, J. S., 577.
Will, D. W., 333.
Williams, C., 516.
Williams, J. D., 531.
Wilson, J. E., 555.
Winn, J. F., 418.
Winterfield, R. W., 443.
Wise, G. H., 507.
Wolfe, H. R., 461.
Woodring, F. R., 417.
Wyler, R., 640.
- Yacowitz, H., 569.
Yamamoto, R., 394.
Yenson, M., 462.
Yoshihara, G. M., 433.
Young, G. A., 636, 639.
Young, R. J., 329.
Young, W. C., 619.
- Zamecnik, P. C., 504.
Zarrow, M. X., 586.
Zietschmann, O., page 110.
Zilvermit, D. B., 571.
Zimmermann, F., 325.
Zitron, C. M., 331.
Znojilová, V., 556.
Zubkova, R. I., 452.
Zwierchowski, J., 474.

The Executive Council of the Commonwealth Agricultural Bureaux is a signatory to the Fair Copying Declaration, details of which can be obtained from the Royal Society, Burlington House, London, W.1.

ABBREVIATIONS OF NAMES OF PUBLICATIONS

The abbreviations used in *Index Veterinarius* and *The Veterinary Bulletin* are those of the *World List of Scientific Periodicals published in the years 1900-1950*, 3rd Edit. (1952), London: Butterworths Scientific Publications.

SOME RECENT PUBLICATIONS OF THE COMMONWEALTH BUREAU OF ANIMAL HEALTH

NEOPLASMS OF THE DOMESTICATED MAMMALS

by E. COTCHIN, M.R.C.V.S., *Royal Veterinary College, London*
Crown 4to stiff cover pp.xv + 100

A comprehensive review covering mainly the period from 1932 onwards.
950 references

Price 20s.

SALMONELLOSIS IN ANIMALS

by A. BUXTON, PhD., M.R.C.V.S., *Dept. Vety. Pathology, University of Liverpool*
Medium 8vo stiff cover pp.v + 209

A comprehensive review covering domestic animals, poultry, fur-bearing animals,
rodents, reptiles and arthropods.
1,750 references

Price 25s.

VETERINARY REVIEWS AND ANNOTATIONS

A half-yearly review of topical subjects.

Annual Subscription 25s.

All the above obtainable from:—

Central Sales Branch, COMMONWEALTH AGRICULTURAL BUREAUX, Farnham Royal,
Nr. Slough, Bucks, England.

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced in 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

About 10,000 references are indexed each year under subjects and under names of authors.

As each issue is a complete alphabetical index of subjects and authors' names, a search through it involves a minimum of trouble, and all information required is readily found.

Stocks of Vols. 13 to 24 are available; price £5 per volume. Other volumes incomplete: details on request.

Orders may be sent to: Central Sales Branch (Commonwealth Agricultural Bureaux), Farnham House, Farnham Royal, Nr. Slough, Bucks.

AUSTRALIA - UNIVERSITY OF SYDNEY

The Senate will shortly proceed to an appointment to the CHAIR OF VETERINARY MEDICINE or the CHAIR OF VETERINARY SURGERY. The present occupant of the Chair of Veterinary Science, Professor R. M. C. Gunn, will retire in 1958 and the Chair under this title will not be filled. Until such time as it is found possible to fill both the Chair of Veterinary Medicine and the Chair of Veterinary Surgery, the person appointed to either Chair will be expected to exercise supervision over the other field.

Salary will be at the rate of £A3,000 per annum, plus cost of living adjustment (£70 men, £53 women). The current scale of salaries is under revision. There is a normal retiring provision under the Professorial Superannuation Scheme and in addition a pension of not less than £A400 per annum upon retirement after the age of 60 years. At present the amount is £A700 per annum.

Under the Staff Members' Housing Scheme, in cases approved by the University and its Bankers, married men may be assisted by loans to purchase a house.

The Senate reserves the right to fill the Chair by invitation.

A statement of conditions of appointment and information for candidates may be obtained on application to the Secretary, Association of Universities of the British Commonwealth, 36 Gordon Square, London, W.C.1.

Applications close, in Australia and London, on *28th February, 1958.*

NUTRITION ABSTRACTS AND REVIEWS

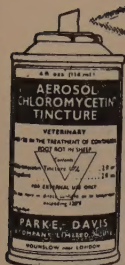
A quarterly journal which covers the fields of human and animal nutrition. It includes everything from analytical, clinical and experimental techniques to immunology and therapeutic diet.

Special attention is given to the relations of diet to health. In the animal section a subsection is devoted to diseases due to dietary deficiency, for instance deficiency of trace elements in pasture; disorders of metabolism such as grass tetany; and the effect of diet on resistance to infections and toxins.

A review article appears in each quarterly issue. Recent articles of particular interest to animal health are: The Fluorine Problem in Livestock Feeding; Vitamin E in the Nutrition of Farm Animals; Nutrition and Host-Helminth Relationships; The Nutrition of the Horse; The Nutritive Value of Herbage for Poultry.

The current volume is Volume 28 (Jan., April, July, Oct., 1958). Price 126s. (U.S.A. \$19.00.)

Back numbers of certain volumes are still available. Subscriptions should be sent to The Secretary, Nutrition Abstracts and Reviews, Rowett Research Institute, Bucksburn, Aberdeenshire, Scotland.



A QUICK PRACTICAL TREATMENT

FOR

CONTAGIOUS FOOT-ROT

ORF · FOUL-OF-THE-FOOT

VENEREAL CONDITIONS

BLACK SPOT

WOUNDS ETC.



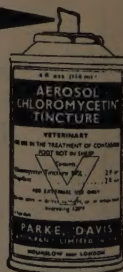
The Aerosol package of Chloromycetin Tincture offers an economic and convenient means of eradicating contagious foot-rot in sheep and treating other hitherto intractable conditions. After preliminary cleaning of the affected feet, Aerosol Chloromycetin Tincture is ready for direct application by a 1-2 second burst. This handy preparation cuts down treatment time and saves labour. Each Aerosol pack permits up to 50 applications, is unspillable, simple to use and prevents wastage.

AEROSOL CHLOROMYCETIN TINCTURE

for greater
convenience and economy

Each pack contains:
2 fl. ozs. Chloromycetin 10% 2 fl. ozs. propellant

Chloromycetin Tincture 10% for brush application is still available. Supplied in bottles of 2 & 16 fl. ozs. with brush



PARKE, DAVIS & CO. LTD., (Inc. U.S.A.) HOUNSLOW · MIDDLESEX

Tel: Hounslow 2361